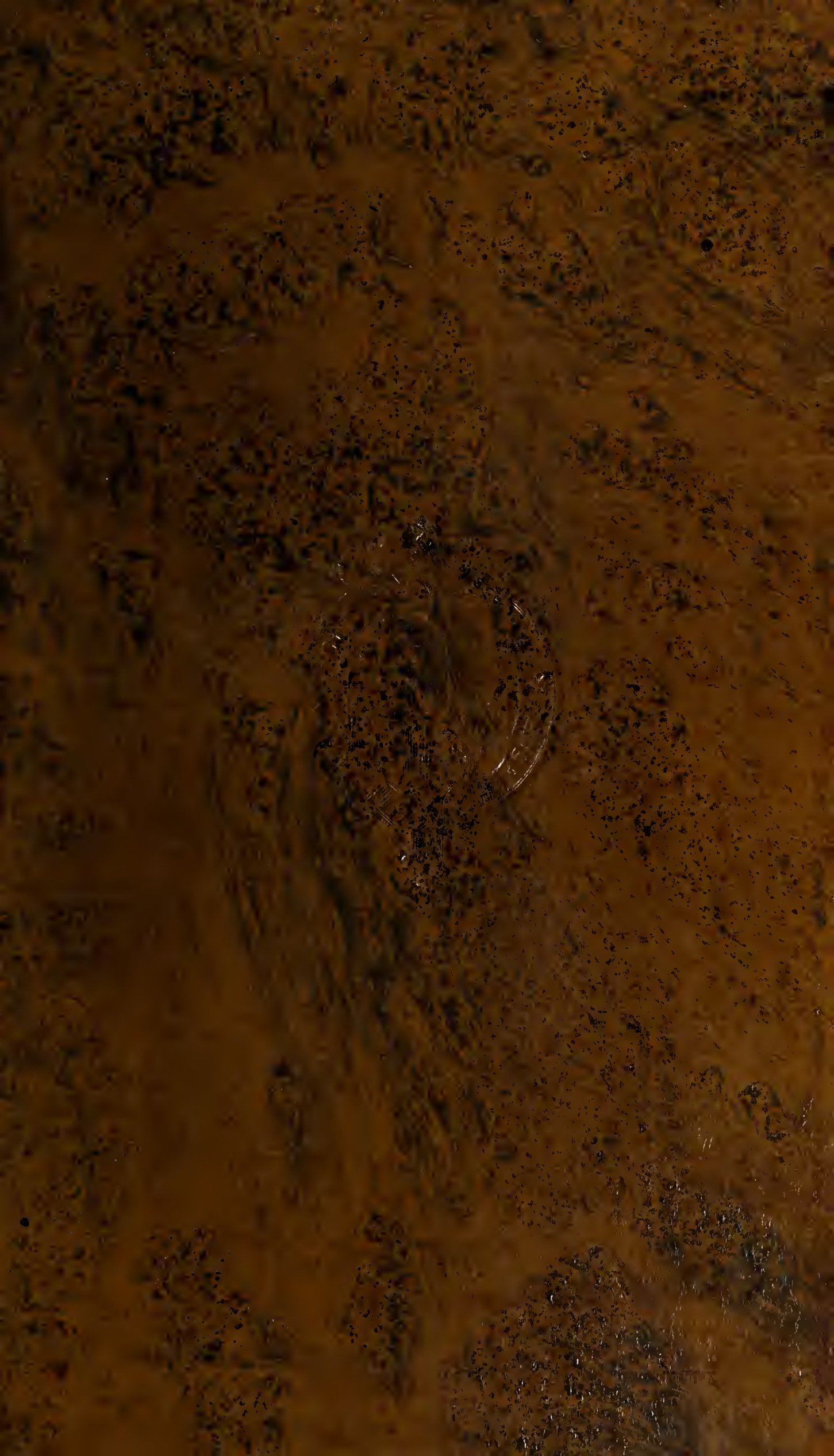
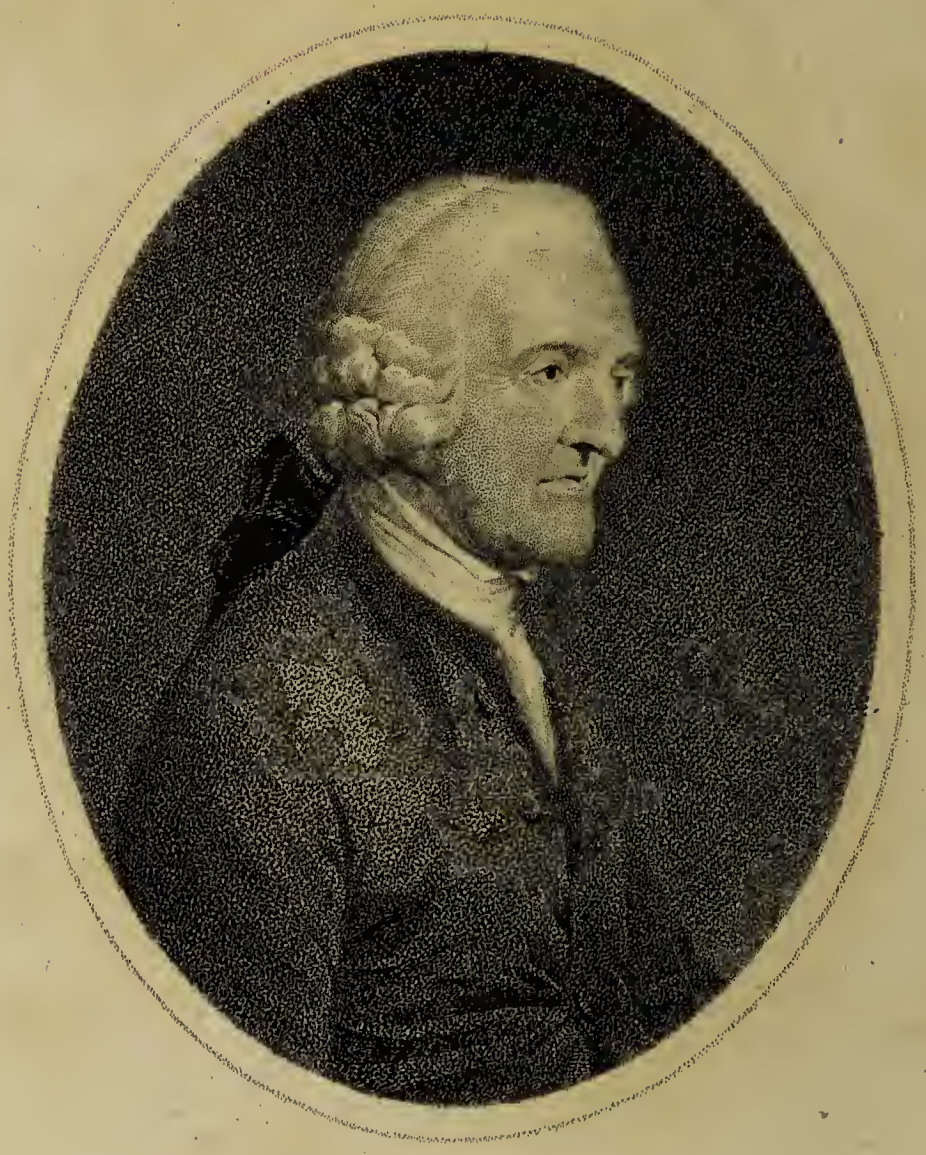


The Marquis of Stafford.



EDWARD HOOPER ESQ.R F.R.S.

Vice President of the Society for the encouragement of

Arts, Manufactures, & Commerce.

Engraved by Wm. Evans from the original Picture painted by Ja.s Barry. R.A.

Professor of Painting to the Royal Academy.

Publish'd as the Act directs June 4. 1796.

16766

TRANSACTIONS

OF THE

SOCIETY

INSTITUTED AT LONDON,

FOR THE

ENCOURAGEMENT

OF

ARTS, MANUFACTURES, and COMMERCE;

WITH THE

PREMIUMS offered in the YEAR 1796:

VOL. XIV.

LONDON:

Printed by W. and C. SPILSBURY, Snow-hill.

To be had, by MEMBERS, of the REGISTER, at the SOCIETY'S HOUSE, in the ADELPHI; and sold by Messrs. DODSLEY, ROBSON, B. and J. WHITE, BECKET, JOHNSON, CADELL and DAVIES, ELMSLEY and BREMNER, WALTER, RICHARDSON, DEBRETT, SEWELL, and TAYLOR.

[Price FIVE SHILLINGS.]

M.DCC.XCVI.

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PREFACE.

THE Frontiſpiece to this Book is an exact reſemblance of the late Edward Hooper, of Hern Court, in the county of Dorſet, Eſq. engraven after a picture painted, in 1778, by James Barry, Eſq. R. A. Profeſſor of Painting to the Royal Academy.

Mr. Hooper was an early Member of this Inſtitution, and, during thirty years, an aſſiduous and active Vice-Preſident of the Society. In conſideration of the ſervices he had uniformly rendered them, by his thorough acquaintance with and ſtrict obſervance of their rules and orders, as well when preſiding at their meetings, as on all other occaſions, their Gold Medal was voted to him in the year 1767; and his name continued in the liſt of their Preſidency to his death, which happened on the 6th day

of September, 1795, in the 95th year of his age, although, for ſome years preceding that period, the Society, in conſideration of his advanced age, had diſpenſed with his perſonal attendance.

By his will, Mr. Hooper bequeathed a legacy to the Society, who, in return for that, and the many important advantages they had received from his attention to their intereſt, have judged proper to perpetuate his memory, by prefixing a likeneſs of him to this volume of their Tranſactions.

The arrangement of the ſeveral parts of this volume will be found ſimilar to many of the foregoing ones: and, as the Premiums offered this Seſſion form the firſt part, it will not be improper to enumerate ſome new objects in the various claſſes into which the buſineſs is divided, and ſtate ſome of the reaſons that have induced the Society to add them to their former liſts.

The firſt new Premium that occurs, is that offered, Claſs 84, for diſcovering a method of preventing the ill-effects of Blights on Fruit-trees, an object highly deſerving

ſerving the attention of the Public. The next in courſe is offered for the Culture of Parſneps, Claſs 102. It is now many years ſince Mr. Budd, of Wandborough, near Guildford, Surry, received a reward for his account of the advantage he had found, by employing Parſneps in feeding Hogs, Cows, and Horſes; and, in the courſe of the laſt ſeſſion, the Society having been informed of ſome remarkable ſucceſs that had attended the feeding Sheep with them, have thought it adviſeable to offer a Premium on this head, that the benefits ariſing from the uſe of this root may be more known; and, when the utility is fully confirmed, the practice may become more general throughout the kingdom.

The advantages that are known to ariſe from the judicious uſe of Water Meadows, have induced the Society to offer a Premium for the moſt ſatisfactory account of the principles on which they ſhould be formed, as may be ſeen, Claſs 112.

At Claſs 139 will be found a Premium offered for an Account, verified by trial, of

deavouring to obtain one, though without effect; but as, from the late high price of wheat, it has been ſuſpected that adulterations of that grain have taken place, and reiterated applications have been made to the Society to again endeavour to obtain a machine well-adapted to the purpoſe; they have thought proper to renew the premium for ſuch a mill, which undoubtedly, if obtained, will be highly uſeful, and fulfil in a great degree the wiſhes of the Public.

The other new Premium under this Claſs unites with the generoſity of the Society evident marks of their humanity—it is that for diſcovering a mode of Cleanſing Chimneys from Soot, without employing children in the flues, in the manner now practiſed, which is known to be always attended with great hardſhips, and frequently with fatal accidents to the children ſo employed (ſee Claſs 218). If, by means of the premium offered for this purpoſe, a proper and convenient mode ſhould be diſcovered and adopted, the ends both of the Society and the Public will be fully anſwered.

There have been produced to the Society, during their late ſeſſion, ſome ſpecimens of Cloves, the growth of the province of Guiana in America, and ſome of the Weſt-India Iſlands; this has induced the Society to offer Premiums for the production of that valuable Spice in any of the Weſt-India Iſlands, ſubject to the Crown of Great-Britain, as will be found in Claſs 223 and 224 of the following book of Premiums.

Having thus given a ſhort account of the new Premiums offered this ſeſſion, it may be thought proper here to mention, that a new æra may this year be aſſumed in the annals of this Society; for, as it appeared to the Society, at the time of their inſtitution, in 1754, that there exiſted in that part of Great-Britain called Scotland, a Society for the Encouragement of Arts, Manufactures, and Commerce, all Premiums offered by this Society have, till the preſent year, been confined to that part of Great-Britain called England, the dominion of Wales, and Town of Berwick upon Tweed, unleſs expreſsly mentioned to the

contrary;

Draining Land, prove that uſeful part of Huſbandry to be extending over many parts of the kingdom, which cannot fail producing the moſt valuable effects, particularly on ſuch ſoils as that deſcribed in Mr. Crockitt's Papers, which, from a ſtate not only of ſterility, but danger to the neighbourhood, are thus rendered in a peculiar degree prolific and uſeful.

The manner of conſtructing Harrows, as recommended by Mr. Knight, of Great Bardfield, it is preſumed, will be found an uſeful improvement of that neceſſary implement of huſbandry; and the ſimple, yet efficacious method of relieving Cattle that are ſwollen, or, in the language of the huſbandman, HOVEN, by eating too voraciouſly of freſh clover, or other ſucculent food, promiſes to be of the firſt importance to all graziers, and others concerned in the management of cattle or ſheep.

In this volume, under the article Chemiſtry, are inſerted ſome Papers relative to the preparing Opium from Poppies grown in England: for, although the Society have invariably

invariably avoided interfering in matters relative to Medicine, yet, as has been already ſeen in the caſe of Rhubarb, they have conſidered the obtaining Drugs in a ſtate of purity, a fit object of their attention; and this ſeſſion have beſtowed a handſome reward on Mr. Ball, of Williton, for the diſcloſure of his method of preparing Opium from Poppies grown in this climate. When it is conſidered of how much importance it is to obtain drugs, of ſuch efficacy as Opium, in the higheſt ſtate of purity, it muſt prove ſatisfactory to every practitioner in phyſic, to obſerve, that the time ſeems approaching, when a drug of ſuch conſequence as Opium may be brought into uſe in a pure and unſophiſticated ſtate.

From a full conviction that the uſeful arts and commercial intereſts of the country would be moſt eſſentially promoted, by diſcovering and perfecting thoſe machines that ſhorten labour and expedite work, an invariable attention has been conſtantly paid to ſuch mechanical contrivances as were moſt likely to conduce to thoſe ends; this occaſioned a Premium to be offered during

many

many years, for weaving Fiſhing Nets in a Machine or Loom: at length ſuch a Machine has been obtained; and a Plate and Deſcription of it will be found under the Claſs of Manufactures, in this volume. Whoever peruſes the following ſheets, will therein find, under the head of Mechanicks, a very ingenious contrivance by a Lady, for applying, in a more efficacious manner than is commonly practiſed, the power of men to the working the Croſs-bar Lever, and which has been ſucceſsfully put in practice n a quarry where pieces of the rock, of conſiderable ſize and weight, were neceſſary to be removed.

The great deſtruction of hempen ropes in large works, and more particularly in founderies where maſſes of metal, in a hot ſtate, are frequently to be removed, induced the Society, ſeveral years ſince, to offer Premiums for the conſtruction of a Metal Rope or Chain that ſhould work well, and in all directions, over pulleys, and at the ſame time ſupport the load in perfect ſecurity: it will appear, that this object has

now

now been obtained; and a Cut of the Chain is annexed to the account, that the Public may be enabled to judge of its efficacy and the nature of its conſtruction.

Among many important articles that have engaged the attention of the Society, for the advantage of the Britiſh Colonies, it is well known that the introduction of the Bread-fruit Tree was one of the principal: this fruit had been celebrated by all the navigators of the South Sea, from Dampier to Captain Cook. Several plants were at length conveyed to the Iſlands of the Weſt-Indies by the laudable perſeverance of Capt. Bligh, whoſe hiſtory is well known, and who received the Gold Medal of this Society as the juſt reward of his merit: It is with peculiar ſatisfaction the Society have lately received, from their valuable correſpondent, Dr. Dancer, the keeper of the Botanic Garden, the following intereſting intelligence, in a letter dated Jamaica, February 1, 1796.

" It will, I aſſure myſelf, be highly ſa-
" tisfactory to the Society, to be informed,
" that

" that the Bread-fruit Trees, which ſo much
" engaged their attention, are bearing very
" plentifully; ſo that we ſhall ſhortly ex-
" perience the full benefit of this import-
" ant acquiſition."

Nor has the attention of the Society been only directed to the Colonies in the Weſt-Indies; for it will appear, that the moſt diſtinguiſhed mark of their approbation has this ſeſſion been given to Robert Wiſſett, Eſq. for having been principally inſtrumental in introducing the organzining Bengal Silk in England; from which there is every reaſon to expect great advantages will ariſe, not only to the inhabitants of Bengal and other parts of the Eaſt-Indies, but to the manufacturers of Silk in Great-Britain.

An examination of the Liſt of the Contributing Members, printed in this volume, will ſhew the flouriſhing ſtate of the Society, whereby they are enabled to fulfil the intention of the inſtitution; and again to invite the ingenious of both ſexes, to ſubmit to them their inventions and works;

from

from whence they will be certain to receive every encouragement and reward; and thus not only ſecure to themſelves a due degree of honour and profit, but have alſo the ſatisfaction of their names being tranſmitted to poſterity, among thoſe who have been inſtrumental in promoting the true intereſts, the riches, and the glory of their country, by contributing to the increaſe and perfection of the Arts, the Manufactures, and Commerce of the kingdom.

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C O N T E N T S.

PREMIUMS

OFFERED BY THE

SOCIETY

FOR THE ENCOURAGEMENT OF

ARTS, MANUFACTURES,

AND

COMMERCE,

IN

THE YEAR M.DCC.XCVI.

TO THE

PUBLIC.

ADELPHI-BUILDINGS,
April 13, 1796.

THE chief objects of the attention of the Society for the Encouragement of Arts, Manufactures, and Commerce, in the application of their Rewards, are, Ingenuity in the ſeveral branches of the POLITE and LIBERAL ARTS, uſeful Diſcoveries and Improvements in AGRICULTURE, MANUFACTURES, MECHANICKS, and CHEMISTRY, or the laying open any ſuch to the Public; and, in general, all ſuch uſeful Inventions, Diſcoveries, or Improvements (though not mentioned in the Book of Premiums), as may appear to have a tendency to the advantage of Trade and Commerce. The Society therefore, in purſuance of their plan, propoſe to beſtow the following Premiums.

Premiums for Planting and Huſbandry.

Claſs 1. ACORNS. For having ſet, between the firſt of October, 1795, and the firſt of April, 1796, the greateſt quantity of land, not leſs than ten acres, with Acorns, with or without ſeeds, cuttings, or plants of other trees, at the option of the Candidate; and for effectually fencing and preſerving the ſame, in order to raiſe timber; the GOLD MEDAL.

2. For the ſecond greateſt quantity of land, not leſs than five acres, ſet agreeably to the above conditions, the SILVER MEDAL.

CERTIFICATES of ſetting agreeably to the above conditions, and that there are not fewer than three hundred young Oaks on each acre, to be delivered to the Society on or before the firſt Tueſday in November, 1796.

3. 4. The ſame premiums are extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in November, 1797.

5, 6. The ſame premiums are extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in November, 1798.

7, 8. The ſame premiums are extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in November, 1799.

9. RAISING OAKS. To the perſon who ſhall have raiſed, ſince the year 1792, the greateſt number of Oaks, not fewer than five thouſand, either from young plants, or acorns, in order to ſecure a ſucceſſion of oak timber in this kingdom; the GOLD MEDAL.

10. For the next greateſt number, not fewer than three thouſand, the SILVER MEDAL.

CERTIFICATES that there were on the land, at leaſt the number of young Oak-trees required, in a thriving condition, two years after the planting, with an account of the methods purſued in making and managing the plantation, to be produced to the Society on or before the firſt Tueſday in January, 1797.

11, 12. The ſame premiums are extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in January, 1798.

13, 14. The ſame premiums are extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in January, 1799.

15. ASCERTAINING THE BEST METHOD OF RAISING OAKS. To the perſon who ſhall aſcertain in the beſt manner, by actual experiments, the comparative merits of the different modes of raiſing

ſing Oaks for timber, either from acorns ſet on land properly grubbed and tilled; from acorns ſown at random among buſhes, fern, or other cover; or from young plants, previouſly raiſed in nurſeries, and tranſplanted; regard being had to the expence, growth, and other reſpective advantages of the ſeveral methods; the GOLD MEDAL.

The ACCOUNTS and proper CERTIFICATES to be produced to the Society on or before the firſt Tueſday in November, 1796.

16. The ſame premium is extended one year further. The ACCOUNTS and CERTIFICATES to be produced on or before the firſt Tueſday in November, 1797.

17. OAK TIMBER IN COMPASS FORMS. To the perſon who ſhall aſcertain, by actual experiments, the beſt method of training young Oaks, ſo as to form Compaſs Timber for Ship-building, the GOLD MEDAL, or FIFTY GUINEAS.

CERTIFICATES of the number of Oak-plants, not fewer than one hundred, that have been trained; and that they promiſe, in the opinion of perſons experienced in ſhip-building, to anſwer the purpoſe intended; to be delivered to the Society on or before the laſt Tueſday in December, 1805.

It is required that with the Certificates there be ſent particular accounts of the age of the trees, when they were begun to be trained, and the methods purſued in training them.

Should any perſon have already engaged in training Oaks for the above purpoſe, any information on the ſubject will be thankfully received by the Society.

18. CHESNUTS. For having ſown or ſet, between the firſt of October, 1795, and the firſt of April, 1796, the greateſt quantity of dry loamy land, not leſs than ſix acres, with Spaniſh Cheſnuts, with or without

without ſeeds, cuttings, or plants of other trees adapted to ſuch ſoil, at the option of the Candidate; and for effectually fencing and preſerving the ſame, in order to raiſe timber; the GOLD MEDAL.

19. For the ſecond greateſt quantity, not leſs than four acres, the SILVER MEDAL.

CERTIFICATES of ſowing or ſetting agreeably to the above conditions, and that there are not fewer than three hundred Cheſnut plants, in a thriving ſtate, on each acre, to be delivered to the Society on or before the firſt Tueſday in November, 1796.

20, 21. The ſame premiums are extended one year further.

CERTIFICATES to be delivered on or before the firſt Tueſday in November, 1797.

22, 23. The ſame premiums are extended one year further.

CERTIFICATES to be delivered on or before the firſt Tueſday in November, 1798.

24, 25. The ſame premiums are extended one year further.

CERTIFICATES to be delivered on or before the firſt Tueſday in November, 1799.

26. ELM. For having planted the greateſt number of the Engliſh Elm, not leſs than eight thouſand, between the twenty-fourth of June, 1794, and the twenty-fourth of June, 1795; and for the having effectually fenced and preſerved the ſame, in order to raiſe timber; the GOLD MEDAL.

27. For the ſecond greateſt number, not leſs than five thouſand, the SILVER MEDAL.

CERTIFICATES of the having planted agreeably to the above conditions, that the plants were in a healthy and thriving ſtate

two

two years at leaſt after making the plantation, and ſpecifying the diſtance of the plants, to be delivered to the Society on or before the firſt Tueſday in April, 1797.

28, 29. The ſame premiums are extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in April, 1798.

30, 31. The ſame premiums are extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in April, 1799.

32, 33. The ſame premiums are extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in April, 1800.

34. LARCH. For having planted out between the twenty-fourth of June, 1793, and

and the twenty-fourth of June, 1794, the greateſt number of Larch-trees, not fewer than five thouſand; and for having effectually fenced and preſerved the ſame, in order to raiſe timber; the GOLD MEDAL.

35. For the next greateſt number, not fewer than three thouſand, the SILVER MEDAL.

CERTIFICATES of the number of plants, that they were in a healthy and thriving ſtate two years at leaſt after they were planted out, with a general account of the methods uſed in making the plantation, to be delivered to the Society on or before the laſt Tueſday in December, 1796.

36, 37. The ſame premiums are extended one year further.

CERTIFICATES to be produced on or before the laſt Tueſday in December, 1797.

38, 39. The ſame premiums are extended one year further.

CERTI-

CERTIFICATES to be produced on or before the laſt Tueſday in December, 1798.

40, 41. The ſame premiums are extended one year further.

CERTIFICATES to be produced on or before the laſt Tueſday in December, 1799.

42, 43. The ſame premiums are extended one year further.

CERTIFICATES to be produced on or before the laſt Tueſday in December, 1800.

N. B. The Larch-trees may be either planted, mixed with other trees, or by themſelves, as may beſt ſuit the convenience of the planter.

44. SILVER FIR. For having planted out, between the twenty-fourth of June, 1792, and the twenty-fourth of June, 1793, in a mixed plantation of foreſt-trees, or ſeparate, according to the option of the Candidate, the greateſt number of Silver Firs,

Firs, not fewer than two thouſand; and for having effectually fenced and preſerved the ſame, in order to raiſe timber; the GOLD MEDAL.

45. For the next greateſt number, not fewer than one thouſand, the SILVER MEDAL.

CERTIFICATES of the number of plants, that they were in a healthy and thriving ſtate two years at leaſt after they were planted out, with a general account of the methods uſed in making the plantation, to be delivered to the Society on or before the laſt Tueſday in December, 1796.

46, 47. The ſame premiums are extended one year further.

CERTIFICATES to be produced on or before the laſt Tueſday in December, 1797.

48, 49. The ſame premiums are extended one year further.

CERTI-

CERTIFICATES to be produced on or before the laſt Tueſday in December, 1798.

50. OSIERS. To the perſon who ſhall have planted, between the firſt of January and the firſt of May, 1796, the greateſt quantity of land, not leſs than three acres, with thoſe kinds of Willows, commonly known by the names of Oſier, Spaniard, or New-kind, fit for the purpoſe of baſket-makers, not fewer than twelve thouſand plants on each acre; the GOLD MEDAL or TWENTY GUINEAS.

51. For the ſecond greateſt quantity of land, not leſs than two acres, the SILVER MEDAL, or TEN GUINEAS.

CERTIFICATES of the planting, and that the plants were in a thriving ſtate five months at leaſt after the planting, to be produced on or before the laſt Tueſday in November, 1796.

52, 53. The ſame premiums are extended one year further.

CERTI-

CERTIFICATES to be produced on or before the laſt Tueſday in November, 1797.

54. ALDER. For having planted, in the year 1793, the greateſt number of Alders, not leſs than three thouſand, on an eſtate the property of one perſon; the GOLD MEDAL.

CERTIFICATES of the number of plants, and that they were in a thriving ſtate two years at leaſt after being planted, to be delivered to the Society on or before the laſt Tueſday in December, 1796.

55. The ſame premium is extended one year further.

CERTIFICATES to be delivered on or before the laſt Tueſday in December, 1797.

56. The ſame premium is extended one year further.

CERTIFICATES to be delivered on or before the laſt Tueſday in December, 1798.

57. The

57. The ſame premium is extended one year further.

CERTIFICATES to be delivered on or before the laſt Tueſday in December, 1799.

58. ASH. For having ſown or ſet, in the year 1793, the greateſt quantity of land, not leſs than ſix acres, with Aſh for timber, with or without ſeeds, cuttings, or plants of ſuch other trees as are adapted to the ſoil; the GOLD MEDAL.

59. For the next greateſt quantity, not leſs than four acres, the SILVER MEDAL.

CERTIFICATES of the ſowing or ſetting agreeably to the above conditions, that there are not fewer than one hundred Aſh plants on each acre, in a thriving and healthy condition, two years at leaſt after the ſowing or ſetting, with a general account of the methods uſed in making the plantation, to be delivered to the Society on

or before the laſt Tueſday in December, 1796.

60, 61. The ſame premiums are extended one year further.

CERTIFICATES to be delivered on or before the laſt Tueſday in December, 1797.

62, 63. The ſame premiums are extended one year further.

CERTIFICATES to be delivered on or before the laſt Tueſday in December, 1798.

64, 65. The ſame premiums are extended one year further.

CERTIFICATES to be delivered on or before the laſt Tueſday in December, 1799.

66, 67. The ſame premiums are extended one year further.

CER-

CERTIFICATES to be delivered on or before the laſt Tueſday in December, 1800.

68. TIMBER-TREES. To the perſon who ſhall have incloſed, planted, or ſown, the greateſt number of acres, not leſs than ten, with the beſt ſorts of Foreſt-trees adapted to the ſoil, for timber, between the firſt of October, 1792, and the firſt of May, 1794; the GOLD MEDAL.

An account of the methods uſed in making the plantations, and of the nature of the ſoil, together with proper Certificates that the trees were in a thriving and healthy ſtate two years at leaſt after making the plantation, to be delivered to the Society on or before the firſt Tueſday in November, 1796.

69. The ſame premium is extended one year further.

The ACCOUNTS and CERTIFICATES to be delivered to the Society on or before the firſt Tueſday in November, 1797.

70. The ſame premium is extended one year further.

The ACCOUNTS and CERTIFICATES to be delivered to the Society on or before the firſt Tueſday in November, 1798.

71. The ſame premium is extended one year further.

The ACCOUNTS and CERTIFICATES to be delivered to the Society on or before the firſt Tueſday in November, 1799.

N. B. With the above Foreſt-trees, the ſeeds, cuttings, or plants, of ſuch other trees as are adapted to the ſoil, and proper for underwood, may or may not be intermixed.

72. PLANTING ORCHARDS. To the perſon who ſhall plant an Orchard after

after the month of Auguſt in the year 1796, in the moſt judicious manner, not leſs than four acres, the GOLD MEDAL, or FIFTY GUINEAS.

73. For the next in merit, the SILVER MEDAL, or THIRTY GUINEAS.

The proof of the value of the improvement of the Orchard ſhall depend on the clear product of the greateſt quantity of fine marketable fruit, to be produced during three ſucceſſive years after the year 1812, and ſold at any public market in England or Wales. Each Perſon who propoſes to become a Candidate for theſe Premiums muſt ſend an account of the number of trees, their culture, pruning, and every circumſtance which can in the leaſt throw any light upon the ſubject; which information will be regiſtered, with a view to form a ſyſtem of rational culture.

74. And that Gentlemen may be induced to come forward, and make and preſerve

ſuch plantations,—The perſon who can produce an ORCHARD which, at the end of three years after planting, ſhall ſhew the greateſt promiſe of ſucceſs, ſhall be entitled to the GOLD MEDAL, or THIRTY GUINEAS.

The merits of the two firſt-mentioned Premiums being to be aſcertained by the fruit; the merit of the third Premium muſt be aſcertained by the judicious number of trees planted, the ſtraitneſs, clearneſs, and freedom of growth of the ſeveral trees; and that all the young branches run free, and at due diſtances from each other, without any galling or canker.

CERTIFICATES of the forming the Orchard, the ſoil and aſpect of the plantation, the ſale and product of the fruit for which the claims for the Premiums, Claſſes 72 and 73, are intended to be made, muſt be delivered to the Society on or before the firſt Tueſday in November, 1815; and the Certificate in claim of the Premium,

Claſs

Claſs 74, muſt be delivered to the Society on or before the firſt Tueſday in November, 1799.

N. B. However expert the Orchardiſt may be in general information and attention, much will depend on ſoil, expoſure, culture, and an eaſy communication to convey the fruit to market; for every field, however valuable in other reſpects, may not be proper for an Orchard.

Any wood the Orchardiſt may chooſe to raiſe for ſhelter to ſuch plantation, is not to be meaſured as part of the Orchard, as the wood will more than ſupport its own expence.

75, 76, 77. The foregoing Premiums for Orchards, from Claſs 72 to Claſs 74, incluſive, are extended one year further. The claims for the Premiums, Claſſes 72 and 73, to be delivered to the Society on or before the firſt Tueſday in November, 1816; and the Certificate in claim of the

Premium, Claſs 74, muſt be delivered on or before the firſt Tueſday in November, 1800.

*** *The Candidates for planting all kinds of Trees are to certify, that the reſpective Plantations are properly fenced and ſecured, and particularly to ſtate the condition the plants were in at the time of ſigning ſuch Certificates.*

Any information which the Candidates for the foregoing Premiums may chooſe to communicate, relative to the methods made uſe of in forming the Plantation, or promoting the growth of the ſeveral Trees, or any other obſervations that may have occurred on the Subject, will be thankfully received.

78. SECURING PLANTATIONS OF TIMBER-TREES. To the perſon who ſhall give to the Society the moſt ſatisfactory Account, founded on experience, of the moſt effectual and leaſt expenſive method of ſecuring young plantations of timber-trees, from Hares and Rabbits,

Rabbits, as well as ſheep and larger cattle, which at the ſame time ſhall be leaſt ſubject to the depredations of wood-ſtealers, the SILVER MEDAL, or TWENTY GUINEAS.

The ACCOUNTS, and CERTIFICATES of the efficacy of the method, to be produced to the Society on or before the firſt Tueſday in November, 1796.

79. The ſame premium is extended one year further.

The ACCOUNTS and CERTIFICATES to be produced on or before the firſt Tueſday in November, 1797.

80. TREES FOR USE WHEN EXPOSED TO THE WEATHER. To the perſon who ſhall ſend the moſt ſatisfactory account and certificate, verified by experiments, to determine which of the following trees is of the greateſt utility for timber or poles, for uſe, when expoſed to the weather, *viz.*

Larch,

Larch,	Aſh,
Black Poplar,	Beech,
Spaniſh Cheſnut,	Silver Fir,
Willow,	Lombardy Poplar;
Alder,	

the GOLD MEDAL.

THE ACCOUNTS and CERTIFICATES to be produced on or before the ſecond Tueſday in December, 1796.

81. PREVENTING THE BLIGHT ON FRUIT-TREES. To the perſon who ſhall diſcover to the Society the beſt and moſt effectual method of preventing the Blight on Fruit-trees, ſuperior to any hitherto known or practiſed, and verified by actual and comparative experiments, the GOLD MEDAL, or THIRTY GUINEAS.

The ACCOUNTS, with proper CERTIFICATES, to be delivered to the Society on or before the ſecond Tueſday in November, 1796.

82. The ſame premium is extended one year further.

The

The ACCOUNTS and CERTIFICATES to be delivered on or before the ſecond Tueſday in November, 1797.

83. The ſame premium is extended one year further.

The ACCOUNTS and CERTIFICATES to be delivered on or before the ſecond Tueſday in November, 1798.

N. B. It is expected that the above-mentioned comparative experiments have been made during three ſucceſſive ſeaſons, and in the ſame aſpect and ſoil; and that, contiguous to them, other trees of the ſame kind with thoſe for which the claim is made, have ſuffered in conſequence of the method not having been made uſe of to them.

84. TAKING OFF THE ILL EFFECTS OF BLIGHTS. To the perſon who ſhall diſcover to the Society the beſt and moſt effectual method of taking off the ill effects of Blights on Fruit-trees, ſuperior

to

to any hitherto known or practiſed, and verified by actual and comparative experiments, The GOLD MEDAL, or THIRTY Guineas.

The ACCOUNTS and CERTIFICTAES to be delivered to the Society on or before the firſt Tueſday in February, 1797.

85. COMPARATIVE CULTURE OF WHEAT. For the beſt ſet of experiments, made on not leſs than eight acres, four of which to be ſown broad-caſt, and four drilled, to aſcertain whether it is moſt advantageous to cultivate wheat by ſowing it in the common broad-caſt way, or by drilling it in equidiſtant rows, hoeing the intervals; the GOLD MEDAL, or the SILVER MEDAL and TWENTY GUINEAS.

It is required that an account of the expence attending each mode of culture, with proper CERTIFICATES of the nature and condition of the land on which the experiments are made, together with an account of the produce of the Corn, be produced

to

to the Society on or before the first Tuesday in February, 1797.

86. COMPARATIVE CULTURE OF WHEAT. For the best set of experiments, made on not less than eight acres of land, four of which to be sown broad-cast, and four dibbled, to ascertain whether it is most advantageous to cultivate Wheat by sowing it in the common broad-cast way, or by dibbling it in equidistant rows, hoeing the intervals; the GOLD MEDAL, or the SILVER MEDAL and THIRTY GUINEAS.

It is required that an account of the expence attending each mode of culture, with proper Certificates of the nature and condition of the land on which the experiments are made, together with an account of the produce of the Corn, be produced to the Society on or before the first Tuesday in February, 1797.

87. BEANS AND WHEAT. To the person who shall have planted or drilled,

between the first of December, 1794, and the first of April, 1795, the greatest quantity of land, not less than ten acres, with Beans, and shall have sown the same land with Wheat in the same year, 1795; TWENTY GUINEAS.

It is required that an account of the sort and quantity of Beans, the time of planting or drilling, and of reaping or mowing them, the produce per acre threshed, the application of the straw, the expence of planting or drilling, hand or horse hoeing, the distance of the rows, and the quality of the soil, together with CERTIFICATES of the number of acres, and that the land was actually sown with Wheat in the year 1795, be produced on or before the first Tuesday in November, 1796.

N. B. The Society have been informed, that Beans may be drilled or planted so early as the month of December, from whence may be derived the advantage of an early harvest; in which case the straw will be far

far more valuable than that from a later planting or drilling.

88. The ſame premium is extended one year further.

The ACCOUNTS to be produced on or before the firſt Tueſday in November, 1797.

89. The ſame premium is extended one year further.

The ACCOUNTS to be produced on or before the firſt Tueſday in November, 1798.

90. TURNEPS. For the beſt account of experiments made on at leaſt ſix acres of land, to determine the comparative advantage of the drill or broad-caſt method in the cultivation of Turneps; the GOLD MEDAL, or the SILVER MEDAL and TEN GUINEAS.

The ACCOUNTS, with proper CERTIFICATES, to be delivered on or before the third Tueſday in March, 1797.

It

It is required that one half of the land be drilled, and the other half ſown broad-caſt.

91. VEGETABLE FOOD. For the beſt account, confirmed by experiments, of the Vegetable Food (Cabbages and Turneps excepted), growing in the months of March and April, that will moſt increaſe the milk in Mares, Cows, and Ewes, at that ſeaſon; provided ſuch food can be cultivated at an expence that will admit of its being applied to the above purpoſes; the GOLD MEDAL, or the SILVER MEDAL and TEN GUINEAS.

CERTIFICATES to be produced on or before the ſecond Tueſday in November, 1796.

92. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the ſecond Tueſday in November, 1797.

93.

93. TURNEP-ROOTED CABBAGE. For having raiſed, and duly cultivated, Turnep-rooted Cabbage, in the year 1795, for the feeding Cattle or Sheep, on the greateſt number of acres, not leſs than ten, and giving an account of the ſoil, culture, expence, time and manner of feeding off, produce, and the effects on Cattle or Sheep fed with it; the GOLD MEDAL, or THIRTY GUINEAS.

94. For the next greater number of acres, not leſs than five, the SILVER MEDAL and TEN GUINEAS.

CERTIFICATES of the quantity of land, with the accounts, to be produced on or before the laſt Tueſday in October, 1796.

95. INCREASED CULTURE OF POTATOES. To the perſon who, in the year 1796, ſhall grow the greateſt weight of Potatoes fit for the table, per acre, on the greateſt quantity of land, not leſs than fifty acres, ſuch land not having been planted

with Potatoes within the laſt ten years; the GOLD MEDAL, or THIRTY GUINEAS.

96. For the greateſt weight per acre, on the next greateſt quantity of land, not leſs than twenty-five acres, the SILVER MEDAL, or FIFTEEN GUINEAS.

97. For the greateſt weight per acre, on the next greateſt quantity of land, not leſs than five acres, TEN GUINEAS.

CERTIFICATES of the quantity of land, and nature of the ſoil, with full accounts of the method of Culture and weight of Potatoes produced, to be delivered to the Society, on or before the third Tueſday in January, 1797.

98. POTATOES FOR FEEDING CATTLE AND SHEEP. To the perſon who, in the year 1795, ſhall have cultivated the greateſt quantity of land, not leſs than four acres, with Potatoes, for the purpoſe of feeding Cattle and Sheep; the GOLD MEDAL, or THIRTY GUINEAS.

CERTI-

CERTIFICATES, with ſatisfactory Accounts of the expence and manner of cultivating the Potatoes, and the application of them to the above purpoſes only, and the ſucceſs that has attended the uſe of them, to be delivered to the Society on or before the ſecond Tueſday in November, 1796.

99. The ſame premium is extended one year further.

CERTIFICATES to be delivered on or before the ſecond Tueſday in November, 1797.

N. B. Should any Gentleman have already cultivated Potatoes for the purpoſes mentioned in the above advertiſement, any information from him on the ſubject will be thankfully received by the Society.

100. CULTIVATING ROOTS AND HERBAGE FOR FEEDING SHEEP, AND BLACK CATTLE. For the moſt ſatisfactory experiments, made between

Michaelmas, 1795, and the firſt of May, 1796, in order to aſcertain which of the following plants can be cultivated and houſed, or otherwiſe ſecured for winter-fodder, to the greateſt advantage, *viz.*

Turnep-rooted Cabbage, Carrots,
Turnep Cabbage, Parſneps,
Turneps, Potatoes;

the GOLD MEDAL.

The ACCOUNTS, with proper Certificates, to be produced on or before the firſt Tueſday in November, 1796.

It is required that the above roots be taken off the land by the laſt day of October, 1795; that a crop of Wheat may be ſown in the ſame ground, and the particulars of the ſowing and planting, taking up, produce, preſerving, and application to the feeding Sheep and Black Cattle, be ſpecified. The comparative experiments muſt be made between two or more of any of the above-mentioned plants, and not leſs than one acre be cultivated with each particular kind of plant.

N. B.

N. B. Great advantage will arise to the Farmer occupying land in the neighbourhood of extensive commons, from the conveniency of keeping large flocks of Sheep, and herds of Cattle, if the difficulty of supporting them through the winter was obviated by a due knowledge of this practice.

101. The same premium is extended one year further.

CERTIFICATES to be produced on or before the first Tuesday in November, 1797.

102. PARSNEPS. To the person who, in the year 1796, shall cultivate the greatest quantity of land, not less than five acres, with Parsneps, for the sole purpose of feeding Cattle or Sheep; the GOLD MEDAL, or THIRTY GUINEAS.

CERTIFICATES of the quantity of land so cultivated, with a particular account of the nature and quality of the soil and pro-

duce, and alſo of the condition of the Cattle or Sheep fed with the Parſneps, and the advantages reſulting from the practice, to be produced to the Society on or before the ſecond Tueſday in February, 1797.

103. The ſame premium is extended one year further. The CERTIFICATES and ACCOUNTS to be produced on or before the ſecond Tueſday in February, 1798.

104. MAKING HAY IN WET WEATHER. To the perſon who ſhall diſcover to the Society the beſt and cheapeſt method, ſuperior to any hitherto practiſed, of making Hay in wet weather, the GOLD MEDAL, or THIRTY GUINEAS.

A full Account of the method employed, and of the expence attending the proceſs, with not leſs than fifty-ſix pounds of the hay; and Certificates that at leaſt the produce of ſix acres of land has been made according to the method deſcribed, and that the whole is of equal quality with the ſamples;

ſamples; to be produced on or before the firſt Tueſday in January, 1797.

105. The ſame premium is extended one year further.

The SAMPLES and CERTIFICATES to be produced on or before the firſt Tueſday in January, 1798.

106. CULTIVATING THE TRUE RHUBARB. For having raiſed, before the end of the year 1796, the greateſt number of plants, not leſs than ſix hundred, of Rheum Palmatum, or true Rhubarb, the GOLD MEDAL.

107. For the next greateſt number, not leſs than four hundred plants, the SILVER MEDAL.

CERTIFICATES of the number of plants, that they ſtand at leaſt four feet aſunder, that they have been in a thriving ſtate during the preceding ſummer, with an account of the ſoil, culture, and aſpect, to be pro-

duced on or before the ſecond Tueſday in February, 1797.

108. ASCERTAINING THE COMPONENT PARTS OF ARABLE LAND. To the perſon who ſhall produce to the Society the moſt ſatisfactory ſet of experiments, to aſcertain the due proportion of the ſeveral component parts of Arable Land, in one or more counties in Great Britain, by an accurate analyſis of it; and who, having made a like analyſis of ſome poor land, ſhall, by comparing the component parts of each, and thereby aſcertaining the deficiencies in the poor ſoil, improve a quantity of it, not leſs than one acre, by the addition of ſuch parts as the former experiments ſhall have diſcovered to be wanting therein, and therefore probably the cauſe of its ſterility; the GOLD MEDAL, or FIFTY GUINEAS.

It is required that the manurings, ploughings, and crops of the improved land, be the ſame after the improvement as before; and

and that a minute account of the produce in each ſtate, of the weather, and of the various influencing circumſtances, together with the method made uſe of in analyſing the ſoils, be produced, with proper CERTIFICATES, and the chemical reſults of the analyſis, which are to remain the property of the Society, on or before the laſt Tueſday in November, 1796.

It is expected that a quantity, not leſs than ſix pounds, of the rich, of the poor, and of the improved ſoils, be produced with the Certificates.

N. B. Among the methods or proceſſes made uſe of by Chemiſts, and called DRY or MOIST, the latter only appears adapted to the aſcertaining the reſpective proportions of the component parts of Arable earth.—Dr. Shaw, in his Chemical Lectures; Dr. Home, in his Principles of Agriculture; Dr. George Fordyce, in his Elements of Agriculture; and Sir Torbern Bergman, in his "Diſſertation ſur les Terres

Terres Géoponiques ;" have treated on theſe ſubjects.

109. The ſame premium is extended one year further.

The ACCOUNTS to be produced on or before the laſt Tueſday in November, 1797.

110. The ſame premium is extended one year further.

The ACCOUNTS to be produced on or before the laſt Tueſday in November, 1798.

111. DRAINING LAND. To the perſon who, in the year 1796, ſhall have made the greateſt number of yards, not fewer than one thouſand, of Hollow Drain, of brick, ſtone, or ſuch like durable materials, with a clear paſſage for the water, of not leſs than ſix inches wide, for the improvement of land injured by water ariſing

ariſing from internal ſprings; the GOLD MEDAL, or THIRTY GUINEAS.

Particular accounts of the nature, quality, ſpontaneous produce, and yearly value of the Land before draining, and the ſuppoſed value afterwards; the nature and texture of the under-ſtrata whence the ſprings ariſe; the depth and width of the drains; the quantity of ſuppoſed water diſcharged; the expence of labour and materials per yard, in length, when finiſhed; a ſketch or plan of all the drains, and their ſeveral inclinations and diſtances from each other; with CERTIFICATES of the number of acres drained, and that the land was actually wet and ſpringy before draining, but dry and firm afterwards; to be produced to the Society on or before the third Tueſday in February 1797.

112. FORMING AND APPLYING WATER MEADOWS. To the perſon who ſhall produce to the Society the moſt ſatisfactory account, verified by practice, of

the principles on which Water Meadows ſhould be formed; and alſo point out the moſt valuable purpoſes to which they may be applied; the GOLD MEDAL, or THIRTY GUINEAS.

The ACCOUNTS to be produced to the Society on or before the third Tueſday in February, 1797.

113. IMPROVING LAND LYING WASTE. For the beſt Account of a method of improving any of the following ſoils, being land lying waſte or uncultivated, *viz.* Clay, Gravel, Sand, Chalk, Moor or Peat-earth and Bog; verified by experiments on not leſs than fifty acres of land; the GOLD MEDAL, or the SILVER MEDAL and TWENTY GUINEAS, for each.

114. For the next greateſt quantity of land, not leſs than twenty-five acres, the SILVER MEDAL and TEN GUINEAS.

To

To be produced, with proper CERTIFICATES, on or before the ſecond Tueſday in December, 1796.

The ſoil, manner of improvement, expence, and product, are required to be fully explained.

115, 116. The ſame premiums are extended one year further.

The ACCOUNTS to be produced on or before the ſecond Tueſday in December, 1797.

117, 118. The ſame premiums are extended one year further.

The ACCOUNTS to be produced on or before the ſecond Tueſday in December, 1798.

119. MANURES. For the moſt ſatisfactory ſet of experiments, to aſcertain the comparative advantages of the following Manures, uſed as Top-dreſſings, on Graſs or Corn Land, viz. Soot, Coal-Aſhes, Wood-Aſhes, Lime, Gypſum, Night-ſoil; the

the GOLD MEDAL, or the SILVER MEDAL and TWENTY GUINEAS.

It is required that the above experiments be made between two or more of the abovementioned Manures, and that not leſs than two acres of land be dreſſed with each Manure. An account of the nature of the ſoil, quantity and expence of the Manure, and crops, with CERTIFICATES, to be produced on or before the laſt Tueſday in February, 1797.

120. The ſame premium is extended one year further.

The ACCOUNTS and CERTIFICATES to be produced on or before the laſt Tueſday in February, 1798.

121. IMPROVING WASTE MOORS. For the improvement of the greateſt number of acres of Waſte Moor-Land, not leſs than one hundred, the GOLD MEDAL.

It is required that the land before improvement be abſolutely uncultivated, and

in

in a great meaſure uſeleſs; that in its improved ſtate it be incloſed, cultivated, and divided into fields, ſufficient for the uſe and occupation of a tenant.

CERTIFICATES of the number of acres, of the quality of the Moor ſo improved, of the mode and expence of the improvement, the ſtate it is in as to the proportion of graſs to arable, and the average value thereof, to be produced on or before the firſt Tueſday in February, 1797.

122. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in February, 1798.

123. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in February, 1799.

124. The ſame premium is extended one year further.

CERTI-

CERTIFICATES to be produced on or before the firſt Tueſday in February, 1800.

125. GAINING LAND FROM THE SEA. To the perſon who ſhall produce to the Society an account of the beſt method, verified by actual experiment, of gaining Land from the Sea, not leſs than twenty acres, on the coaſt of England or Wales; the GOLD MEDAL.

CERTIFICATES of the quantity of Land, and that the experiments were begun after the firſt of January, 1791, to be produced to the Society on or before the firſt Tueſday in October, 1796.

N. B. The Society have been credibly informed, that land has been gained on the coaſt of Holland, by fixing rows of whiſps of ſtraw upright in the ſand, at about a foot diſtant from each other, or by fixing ſtakes at proper diſtances from each other, and wattling ſtraw-bands between them.

126. The ſame premium is extended one year further.

CERTI-

CERTIFICATES to be produced on or before the firſt Tueſday in October, 1797.

127. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in October, 1798.

128. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in October, 1799.

129. MACHING FOR DIBBLING WHEAT. To the perſon who ſhall invent the beſt Machine, to anſwer the purpoſe of Dibbling Wheat, by which the holes for receiving the grain may be made at equal diſtances and proper depths, the grain regularly delivered therein, and effectually covered; the SILVER MEDAL, or TWENTY GUINEAS.

The MACHINE, with CERTIFICATES that at leaſt three acres have been dibbled by it, to be produced to the Society on or before the ſecond Tueſday in January, 1797. Simplicity and cheapneſs in the conſtruction will be conſidered as principal parts of its merit.

130. MACHINE TO ANSWER THE PURPOSE OF REAPING OR MOWING CORN. For inventing a Machine to anſwer the purpoſe of mowing or reaping Wheat, Rye, Barley, Oats, or Beans, by which it may be done more expeditiouſly and cheaper than by any method now practiſed, provided it does not ſhed the corn or pulſe more than the methods in common practice, and that it lays the ſtraw in ſuch a manner as that it may be eaſily gathered up for binding; the SILVER MEDAL, or TEN GUINEAS.

The MACHINE, with CERTIFICATES that at leaſt three acres have been cut by it, to be produced to the Society on or before the ſecond Tueſday in December, 1796.

Simplicity

Simplicity and cheapneſs in the conſtruction will be conſidered as principal parts of its merit.

131. IMPROVED HOE. To the perſon who ſhall produce to the Society the moſt improved or beſt-conſtructed Horſe or Hand Hoe, ſuperior to any hitherto in uſe, for the purpoſe of clearing from weeds, and looſening the ſoil in the intermediate ſpaces of all crops of corn ſown in equidiſtant rows, and which ſhall earth up the young plants at the ſame time; the GOLD MEDAL, or TWENTY GUINEAS.

A HOE, with CERTIFICATES of its having been ſucceſsfully uſed, to be produced to the Society on or before the firſt Tueſday in December, 1796.

132. The ſame premium is extended one year further.

The HOE, with CERTIFICATES, to be produced on or before the firſt Tueſday in December, 1797.

133. DESTROYING THE GRUB OF THE COCKCHAFER. To the perſon who ſhall diſcover to the Society an effectual method, verified by repeated and ſatisfactory trials, of deſtroying the Grub of the Cockchafer, or of preventing or checking the deſtructive effects which always attend Corn, Peas, Beans, and Turneps, when attacked by thoſe inſects; the GOLD MEDAL, or THIRTY GUINEAS.

The ACCOUNTS, with proper CERTIFICATES, to be produced on or before the firſt Tueſday in January, 1797.

134. DESTROYING THE WIRE-WORM. To the perſon who ſhall diſcover to the Society, an effectual method, verified by repeated and ſatisfactory trials, of deſtroying the inſect called the Wire-worm, or of preventing or checking the deſtructive effects which always attend Corn, Beans, Peas, or Pulſe, when attacked by thoſe inſects; the GOLD MEDAL, or THIRTY GUINEAS.

The

The ACCOUNTS, with proper CERTIFICATES, to be produced to the Society on or before the first Tuesday in January, 1797.

135. DESTROYING THE FLY ON HOPS, AND CATERPILLARS ON FRUIT-TREES AND CULINARY PLANTS. To the person who shall discover to the Society an easy and efficacious method of destroying the Fly on Hops, and Caterpillars on Fruit-trees and culinary Plants, superior to any hitherto known or practised, the GOLD MEDAL or THIRTY GUINEAS.

ACCOUNTS and CERTIFICATES that the method has been effectually practised on not less than six acres of Hop-ground, or an Orchard or Garden of not less than two acres, to be delivered to the Society on or before the first Tuesday in February, 1797.

136. CURE OF THE ROT IN SHEEP. To the person who shall dis-

cover to the Society the beſt and moſt effectual method of preventing or curing the diſeaſe called the Rot in Sheep, verified by repeated and ſatisfactory experiments, the GOLD MEDAL, or THIRTY GUINEAS.

It is expected that the Candidates furniſh accurate accounts of the nature, ſymptoms, and cure of the diſeaſe, together with the imputed cauſe thereof, and the actual or probable means of prevention, which, with proper CERTIFICATES, muſt be delivered to the Society on or before the firſt Tueſday in February, 1797.

137. PREVENTING AND CURING THE ILL EFFECTS OF THE FLY ON SHEEP. To the perſon who ſhall diſcover to the Society the moſt effectual method of preventing and curing the ill effects of the Fly on Sheep, the SILVER MEDAL, or THIRTY GUINEAS.

It is required that the method be aſcertained by repeated experiments, and that a

CERTIFICATE of its efficacy be delivered to the Society on or before the firſt Tueſday in December, 1796.

138. The ſame premium is extended one year further.

The ACCOUNTS and CERTIFICATES to be delivered to the Society on or before the firſt Tueſday in December, 1797.

139. PROTECTING SHEEP. To the perſon who, in the year 1797, ſhall protect the greateſt number of Sheep, not fewer than five hundred, in bad ſeaſons, by houſing them in hovels, or ſheds; and give the moſt ſatisfactory account, verified by experiment, of the advantages ariſing from the practice of defending Sheep from the inclemency of the weather, by ſuch hovels, or ſheds; TWENTY GUINEAS.

A particular account of the experiments made, with the advantages ariſing therefrom, together with the expence, and Certificates

of its utility, to be produced to the Society on or before the firſt Tueſday in March 1798.

N. B. It is at the option of the Candidates to have their hovels fixed, or moveable; and it is required, that the CERTIFICATES ſhall ſpecify the length of time the Sheep were under cover, and the manner in which they were maintained during that time; together with the general method of managing them in the ſaid hovels.

Premiums for Diſcoveries and Improvements in Chemiſtry, Dying, and Mineralogy.

140. BARILLA. For the greateſt quantity of Merchantable Barilla, not leſs than half a ton, made from Spaniſh Kali, or any other plant raiſed in great Britain, the GOLD MEDAL, or THIRTY GUINEAS.

A ſample of not leſs than twenty-eight pounds, with a CERTIFICATE that half a ton has been made, to be produced on or before the firſt Tueſday in January, 1797.

141. PRESERVING SEEDS OF VEGETABLES. For the beſt method of preſerving the ſeeds of Plants in a ſtate fit for vegetation a longer time than has hitherto been practiſed, ſuch method being ſuperior to any known to the public, and verified by ſufficient trial; to be communicated to the Society on or before the firſt Tueſ-

Tuesday in December, 1796; the GOLD MEDAL, or THIRTY GUINEAS.

142. The same premium is extended one year further; the ACCOUNTS to be produced on or before the first Tuesday in December, 1797.

143. METHOD OF SEPARATING THE SACCHARINE SUBSTANCE OF TREACLE IN A SOLID FORM. To the person who shall discover to the Society the best method of separating the Saccharine Substance of Treacle in a solid form, at such an expence as will render it advantageous to the public; the GOLD MEDAL, or FIFTY GUINEAS.

A quantity of the Saccharine Substance, so separated, in a solid form, not less than thirty pounds weight, with an account of the process, and CERTIFICATES that not less than one hundred weight has been prepared, to be produced to the Society on or before the first Tuesday in February, 1797.

144.

144. The ſame premium is extended one year further.

SAMPLES and CERTIFICATES to be produced to the Society on or before the firſt Tueſday in February, 1798.

145. PRESERVING FRESH-WATER SWEET. To the perſon who ſhall produce to the Society the beſt account, verified by ſatisfactory trials, of an efficacious method of preſerving Freſh-water ſweet during long voyages, the GOLD MEDAL, or FIFTY GUINEAS.

ACCOUNTS, and full deſcriptions of the methods made uſe of, in order that it may be known that nothing injurious enters therein, to be produced to the Society, with at leaſt thirty gallons of Water ſo preſerved, and proper CERTIFICATES, on or before the laſt Tueſday in December, 1796.

146. The ſame premium is extended one year further.

The

The ACCOUNTS and CERTIFICATES to be produced on or before the laſt Tueſday in December, 1797.

147. DESTROYING SMOKE. For the beſt account, aſcertained by proper experiments, of a method of deſtroying or burning the Smoke of fires belonging to Steam-Engines, Furnaces employed in calcining or ſmelting Metals, or other large works, in order to prevent annoyance to the neighbourhood; to be produced on or before the firſt Tueſday in January, 1797; the GOLD MEDAL, or THIRTY GUINEAS.

148. The ſame premium is extended one year further.

The ACCOUNTS to be produced on or before the firſt Tueſday in January, 1798.

149. CONDENSING SMOKE. To the perſon who ſhall invent the beſt method by which the Smoke of Steam-Engines

gines, Brewhouſes, Sugar-houſes, or Furnaces, may be advantageouſly condenſed and collected in the form of Tar, or ſome other uſeful material; the GOLD MEDAL, or FIFTY GUINEAS.

The ACCOUNTS, with proper CERTIFICATES of the method having been ſucceſsfully employed, and ſpecimens of the materials produced, to be delivered to the Society on or before the firſt Tueſday in December, 1796.

150. The ſame premium is extended one year further.

The ACCOUNTS and CERTIFICATES to be produced on or before the firſt Tueſday in December, 1797.

151. CANDLES FROM RESIN. To the perſon who ſhall diſcover to the Society the beſt method of ſo reducing the inflammable quality of Reſin, as to adapt it to the purpoſes of making Candles fit for common uſe, at a price much infe-

rior

rior to that of Candles made of Tallow only; the GOLD MEDAL, or THIRTY GUINEAS.

Six pounds at leaſt of the Candles ſo prepared, with an ACCOUNT of the proceſs, to be delivered to the Society on or before the firſt Tueſday in December, 1796.

152. REFINING WHALE OR SEAL OIL. For diſcloſing to the Society an effectual method of purifying Whale or Seal Oil from the glutinous matter that encruſts the wicks of lamps, and extinguiſhes the light, though fully ſupplied with oil; the GOLD MEDAL, or FIFTY GUINEAS.

It is required that the whole of the proceſs be fully and fairly diſcloſed, in order that ſatisfactory experiments may be made by the Society, to determine the validity of the claim; and CERTIFICATES that not leſs than twenty gallons have been purified according to the proceſs delivered in, together with two gallons of the oil

in

in its unpurified ſtate, and two gallons ſo refined, be produced to the Society on or before the ſecond Tueſday in February, 1797.

153. The ſame premium is extended one year further.

CERTIFICATES and SAMPLES to be produced on or before the ſecond Tueſday in February, 1798.

154. CLEARING FEATHERS FROM THEIR ANIMAL OIL. To the perſon who ſhall diſcover to the Society the beſt and moſt expeditions method, ſuperior to any hitherto practiſed, of clearing Gooſe-feathers from their offenſive Animal Oil, for the uſe of upholders in making beds, cuſhions, &c. the GOLD MEDAL, or FORTY GUINEAS.

A quantity of ſuch Feathers, unſtripped, and ſo cleared, not leſs than forty pounds weight, with a full account of the proceſs, to be produced to the Society on or before the firſt Tueſday in February, 1797.

155. SUBSTITUTE FOR, OR PREPARATION OF, YEAST. For diſcovering to the Society an effectual Subſtitute for Yeaſt, or preparation of Yeaſt, which, after being kept ſix months, ſhall be fit for fermenting liquors, and raiſing bread; the GOLD MEDAL, or THIRTY GUINEAS.

Specimens of the Subſtitute, or of the Preparation of Yeaſt, ſufficient for trials, together with a paper ſealed up, and containing an account of the compoſition of the Subſtitute, or method of preparing the Yeaſt, to be produced on or before the laſt Tueſday in November, 1796.

156. PROOF SPIRIT. To the Diſtiller who in the year 1796 ſhall make the greateſt quantity, not leſs than one hundred gallons, of a clean marketable Spirit, from articles not the food of man or cattle, equal in ſtrength or quality to the Proof Spirit now in uſe, and at a rate not higher than the ſpirit produced from corn or mo-

laſſes; the GOLD MEDAL, or FIFTY GUINEAS.

Ten gallons of the ſpirit, together with proper CERTIFICATES, and a full account of the expence and mode of making it, to be produced to the Society on or before the firſt Tueſday in January, 1797.

157. STARCH. To the Starch-maker who, in the year 1796, ſhall make the greateſt quantity, not leſs than two hundred weight of Starch, from materials not uſed as food for man; the GOLD MEDAL, or THIRTY GUINEAS.

Five pounds of the Starch ſo prepared, together with proper CERTIFICATES that the whole quantity is of the ſame quality, and with a full diſcloſure of the mode of making it, to be produced to the Society on or before the ſecond Tueſday in January, 1797.

158. PRESERVING SALTED PROVISIONS FROM BECOMING RANCID OR RUSTY. To the perſon who

ſhall diſcover to the Society the beſt, cheapeſt, and moſt efficacious method of preſerving Salted Proviſions from growing rancid or ruſty; the GOLD MEDAL, or THIRTY GUINEAS.

A full deſcription of the method, with proper CERTIFICATES that it has been found, on repeated trials, to anſwer the purpoſe intended, to be produced to the Society on or before the firſt Tueſday in February, 1797.

159. The ſame premium is extended one year further.

The ACCOUNTS and CERTIFICATES to be produced to the Society on or before the firſt Tueſday in February, 1798.

160. INCREASING STEAM. To the perſon who ſhall diſcover to the Society a method, verified by actual experiments, of increaſing the quantity or the force of Steam, in Steam-Engines, with leſs fuel than is uſually employed, provided that in

general the whole amount of the expences in using Steam-Engines may be considerably leſſened; the GOLD MEDAL, or THIRTY GUINEAS.

To be communicated to the Society on or before the firſt Tueſday in January, 1797.

N. B. As it is well known there are methods of preventing the ebullition of liquids by the addition of particular matters in the boiling, it is ſubmitted to the conſideration of the ingenious, whether, by the addition of ſome matters, or by ſome mechanical operations, the boiling and evaporation may not be increaſed.

161. PREVENTING THE DRY-ROT IN TIMBER. To the perſon who ſhall diſcover to the Society the cauſe of the Dry-Rot in Timber, and diſcloſe a certain method of prevention, ſuperior to any hitherto known; the GOLD MEDAL, or THIRTY GUINEAS.

The ACCOUNTS of the cauſe, and method of prevention, confirmed by repeated experiments, to be produced to the Society on or before the ſecond Tueſday in December, 1796.

162. The ſame premium is extended one year further.

The ACCOUNTS to be produced on or before the ſecond Tueſday in December, 1797.

163. FINE BAR-IRON. To the perſon, in England or Wales, who ſhall make the greateſt quantity of Bar-Iron, not leſs than ten tons, with Coak, from Coak Pigs, equal in quality to the beſt Iron imported from Sweden or Ruſſia, and as fit for converting into Steel; the GOLD MEDAL.

SAMPLES, not leſs than one hundred weight, with CERTIFICATES that the whole quantity is of equal quality, to be produced to the Society on or before the firſt Tueſday in January, 1797.

164.

164. The ſame premium is extended one year further.

SAMPLES and CERTIFICATES to be delivered on or before the firſt Tueſday in January, 1798.

165. METHOD OF PREPARING WHITE LEAD, WHICH SHALL NOT BE PREJUDICIAL. To the perſon who ſhall diſcover to the Society a method of preparing White Lead, in a manner that ſhall not be prejudicial to the health of the workmen employed either in making or uſing it, and will anſwer all the purpoſes for which White Lead is at preſent uſed; the GOLD MEDAL, or FIFTY GUINEAS.

A quantity of the White Lead ſo prepared, with an account of the proceſs made uſe of, and CERTIFICATES that not leſs than one ton has been manufactured in the ſame manner, to be produced to the Society on or before the ſecond Tueſday in February, 1797.

166. SUBSTITUTE FOR THE BASIS OF PAINT. To the perſon who ſhall produce to the Society the beſt Subſtitute, ſuperior to any hitherto known, for the Baſis of Paint, equally proper for the purpoſe as the White Lead now employed; ſuch ſubſtitute not to be of a noxious quality, and which may be afforded at a price not materially higher than that of White Lead; the GOLD MEDAL, or THIRTY GUINEAS.

A quantity of the Subſtitute, not leſs than fifty pounds weight, with an ACCOUNT of the proceſs uſed in preparing it, and CERTIFICATES that at leaſt one hundred weight has been manufactured, to be produced to the Society on or before the ſecond Tueſday in November, 1796.

167. The ſame premium is extended one year further.

CERTIFICATES and ACCOUNTS to be produced on or before the ſecond Tueſday in November, 1797.

168.

168. REFINING BLOCK TIN. To the perſon who ſhall diſcover to the Society the beſt method of purifying or refining *Block Tin*, in ſuch manner as to render it fit for the finer purpoſes to which *Grain Tin* is now ſolely applied, and at an expence that ſhall not render it higher in price than *Grain Tin*; the GOLD MEDAL, or FIFTY GUINEAS.

CERTIFICATES that not leſs than three tons have been refined or purified, with a full detail of the proceſs, and a quantity, not leſs than one hundred weight, of the Tin ſo refined, to be produced to the Society on or before the firſt Tueſday in November, 1796.

169. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in November, 1797.

170. GLAZING EARTHEN WARE WITHOUT LEAD. To the

perſon who ſhall diſcover to the Society the cheapeſt, ſafeſt, moſt durable, and moſt eaſily fuſible Compoſition, fit for the purpoſe of glazing the ordinary kinds of Earthen Ware, without any preparation of Lead, and preferable to any hitherto in uſe; the GOLD MEDAL, or THIRTY GUINEAS.

SPECIMENS of the Ware ſo glazed, with proper CERTIFICATES of its having ſucceeded, and a SAMPLE of the materials made uſe of, to be produced to the Society on or before the firſt Tueſday in February, 1797.

171. PURIFYING BRACKISH WATER. To the perſon who ſhall diſcover to the Society the beſt and cheapeſt method, verified by actual experiment, of Purifying or Reducing Brackiſh Water, which frequently ariſes from New Wells, made in particular places, to a natural ſweetneſs, fit for the uſe of families and for the purpoſe of cattle; the SILVER MEDAL, and FIFTEEN GUINEAS.

Satisfactory CERTIFICATES that ſuch Brackiſh Water has been rendered perfectly ſweet, and uſed by the family to which ſuch Well may belong at leaſt three months afterwards, with an account of the method made uſe of in purifying the ſame, to be delivered to the Society on or before the ſecond Tueſday in February, 1797.

172. BLACK DYE ON COTTON. To the perſon who ſhall invent and produce to the Society a Black Dye on Cotton Yarn, ſuperior to any hitherto known or in uſe; the GOLD MEDAL, or THIRTY GUINEAS.

A full ACCOUNT of the proceſs, with CERTIFICATES that the cotton thus dyed ſtands waſhing with ſoap, and a SAMPLE of the yarn ſo dyed, not leſs than five pounds weight, to be produced to the Society on or before the firſt Tueſday in February, 1797.

173. PRESERVING IRON FROM RUST. To the perſon who ſhall invent and diſcover to the Society, a cheap compoſition

position, which ſhall effectually preſerve wrought iron from ruſt; the GOLD MEDAL, or FIFTY GUINEAS.

A full deſcription of the method of preparing the compoſition, with CERTIFICATES that it has ſtood at leaſt two years unimpaired, and expoſed to the atmoſphere during the whole time, to be produced to the Society, with ten pounds weight of the compoſition, on or before the firſt Tueſday in January, 1799.

174. The ſame premium is extended one year further. The deſcription and CERTIFICATES to be produced to the Society on or before the firſt Tueſday in January, 1800.

Premiums for promoting the Polite Arts.

175. HONORARY PREMIUMS FOR DRAWINGS. For the beſt Drawing of any kind, made with Water-Colours, Crayons, Chalk, Black Lead, Pen, Indian Ink, or Biſter, by young Gentlemen under the age of twenty-one, ſons or grandſons of Peers or Peereſſes in their own right, of Great Britain or Ireland, to be produced on or before the firſt Tueſday in March, 1797; the HONORARY MEDAL of the Society IN GOLD.

176. The ſame IN SILVER for the next in merit.

177, 178. The ſame premiums will be given, on the like conditions, to young Ladies, daughters or grand-daughters of Peers, or Peereſſes in their own right, of Great-Britain or Ireland.

179. HONORARY PREMIUMS FOR DRAWINGS. For the beſt Drawing of any kind, made with Water-colours, Crayons, Chalk, Black Lead, Pen, Indian Ink, or Biſter, by young Gentlemen under the age of twenty-one; to be produced on or before the firſt Tueſday in March, 1797; the GOLD MEDAL.

180. For the next in merit, the SILVER MEDAL.

181, 182. The ſame premiums will be given for Drawings by young Ladies.

N. B. As the foregoing Honorary Premiums are intended only for ſuch of the Nobility and Gentry as may hereafter become patrons or patroneſſes of the Arts; perſons profeſſing any branch of the Polite Arts, or any buſineſs dependent on the Arts of Deſign, or the ſons or daughters of ſuch perſons, will not be admitted Candidates in theſe Claſſes.

The following Premium (Claſs 183) is offered in conformity to the Will of the late John Stock, of Hampſtead, Eſq.

183. DRAWING. For the beſt Drawing in perſpective of the Water-gate at York-buildings, not leſs than eighteen inches high, to be produced on or before the third Tueſday in February, 1797, a SILVER MEDALLION, with the following engraved inſcription: *The Premium given by the Society for the Encouragement of Arts, Manufactures, and Commerce, in conformity to the Will of John Stock, of Hampſtead, Eſq.* The Drawing to be left with the Society as their property.

184. DRAWINGS OF OUTLINES. For the beſt Outline, after an original group or caſt, in plaſter, of Human Figures, by perſons of either ſex, under the age of ſixteen, the principal figure not leſs than twelve inches; to be produced on or before the third Tueſday in February, 1797; the greater SILVER PALLET.

185.

185. For the next in merit, the leſſer SILVER PALLET.

N. B. Theſe drawings are to be made on Paper, with Chalk, Black Lead, Indian Ink, or Biſter; and the original either to be produced to the Society, or to be referred to for their examination.

186. DRAWINGS OF LANDSCAPES. For the beſt Drawing of a Landſcape after nature, by perſons of either ſex under twenty-one years of age, to be produced on or before the third Tueſday in February, 1797, the greater SILVER PALLET.

187. For the next in merit, the leſſer SILVER PALLET.

Each Candidate muſt mention on the front of the Drawing, from whence the View was taken; and the Drawings muſt be made with Chalk, Pen, Indian Ink, Water-Colours, or Biſter.

188. HISTORICAL DRAWINGS. For the beſt Hiſtorical Drawing, being an original

original compoſition, of five or more Human Figures; the height of the principal figure not leſs than eight inches; to be made with Crayons, Chalk, Black Lead, Pen, Indian Ink, Water-colours, or Biſter, and to be produced on or before the third Tueſday in February, 1797; the GOLD PALLET.

189. For the next in merit, the greater SILVER PALLET.

190. SURVEYS OF COUNTIES. To the perſon who, in the year 1796, ſhall complete and publiſh an accurate Survey of any one County in England or Wales, on a ſcale of not leſs than one inch to a mile, for which rewards have not already been given by the Society; the GOLD MEDAL, or FIFTY GUINEAS.

CERTIFICATES of the accuracy of the Survey, and that it was begun after the firſt of June, 1792, together with the Map, to be produced on or before the laſt Tueſday in January, 1797.

The

The Map to which the premium ſhall be adjudged, to remain the property of the Society.

N. B. The Society are already in poſſeſſion of Surveys of the following Counties, viz. Bedford, Cornwall, Devonſhire, Derbyſhire, Cheſhire, Durham, Somerſetſhire, Northumberland, Suffolk, Leiceſterſhire, Cumberland, Lancaſhire, Dorſetſhire, Hampſhire, Glouceſterſhire, Herefordſhire, Hertfordſhire, Huntingdonſhire, Northamptonſhire, Nottinghamſhire, Surrey, Suſſex, Weſtmorland, and Worceſterſhire.

191. The ſame premium is extended one year further.

The Survey to be begun after the firſt of June, 1793; and the Map to be produced on or before the laſt Tueſday in January, 1798.

192. The ſame premium is extended one year further.

The

The Survey to be begun after the firſt of June, 1794; and the Map to be produced on or before the laſt Tueſday in January, 1799.

193. The ſame premium is extended one year further.

The Survey to be begun after the firſt of June, 1795; and the Map to be produced on or before the laſt Tueſday in January, 1800.

194. NATURAL HISTORY. To the Author who ſhall publiſh, in the year 1796, the Natural Hiſtory of any County of England or Wales; the GOLD MEDAL, or FIFTY GUINEAS.

It is required that the ſeveral natural productions, whether animal, vegetable, or mineral, peculiar to the county, or found therein, be carefully and ſpecifically arranged and deſcribed, in order that the Public may be enabled to judge what Arts or Manufactures are moſt likely to ſucceed in ſuch County.

The Work to be delivered to the Society on or before the laſt Tueſday in January, 1797.

195. The ſame premium is extended one year further.

The Work to be delivered to the Society on or before the laſt Tueſday in January, 1798.

196. The ſame premium is extended one year further.

The Work to be delivered to the Society on or before the laſt Tueſday in January, 1799.

CONDITIONS.

No perſon who has gained the firſt premium in any Claſs, will be admitted a Candidate in a Claſs of an inferior age; and no Candidate ſhall receive more than one Premium in one year; nor will they who for two ſucceſſive years ſhall gain the firſt Premium in one Claſs, be ever again admitted as Candidates in that Claſs.

No

No perſon ſhall ever be admitted a Candidate in any Claſs, in which he has three times obtained the whole of the firſt Premium.

No Candidate ſhall ſend in more than one Performance in any one Claſs.

All the Claims which are produced each Seſſion before the Committee of Polite Arts, (to which Premiums or Bounties are adjudged) are to remain with the Society till after the public diſtribution of rewards in May.

No Claim for a Premium in the Polite Arts will be admitted, that has obtained, or has been produced in order to obtain, a Premium, Reward, or Gratification, from any other Society, or any Academy or School.

All Performances that obtain Premiums in the Polite Arts, muſt be begun after the publication of ſuch Premiums.

Purpoſely to encourage real merit, and to prevent any attempts to impoſe on the Society, by producing Drawings which ſhall have been made or retouched by any

other perſon than the Candidate, the Society is reſolved, upon all occaſions, with reſpect to the ſucceſsful Candidates in Claſſes 183 to 188 incluſive, to prove their abilities, by requiring a ſpecimen made under the inſpection of the Committee of Polite Arts, in every inſtance where ſuch proof can be obtained.

It is required that all Candidates in the Polite Arts, do ſignify, on their Drawings, their age; and whether the performances are originals, or copies; and, if copies, whence they were taken.

Premiums

Premiums for encouraging and improving Manufactures.

197. SILK. For the greateſt quantity of merchantable Silk, not leſs than ten pounds weight, produced by worms bred in England in the year 1796, the property of any one perſon; the GOLD MEDAL.

198. For the ſecond greateſt quantity, not leſs than five pounds weight, the SILVER MEDAL.

SPECIMENS of the SILK, not leſs than one pound, with CERTIFICATES that the whole is of equal quality, and produced in England, to be delivered to the Society on or before the firſt Tueſday in January, 1797.

199. MACHINE FOR CARDING SILK. For the beſt Machine, ſuperior to any now in uſe, for carding Waſte Silk equally well as by hand; to be produced, together with a ſpecimen of the Cardings,

on or before the firſt Tueſday in November, 1796; the GOLD MEDAL, or THIRTY GUINEAS.

200. CLOTH FROM HOP-STALKS OR BINES. To the perſon who ſhall produce to the Society the greateſt quantity, not leſs than thirty yards, of Cloth, at leaſt twenty-ſeven inches wide, made in England or Wales, of Hop-Stalks or Bines, and ſuperior to any hitherto manufactured in England of that material, the GOLD MEDAL, or THIRTY GUINEAS.

One pound of the Thread of which the Cloth is made, and thirty yards of the Cloth, together with proper CERTIFICATES that the whole is manufactured from Hop-Stalks or Bines, to be produced to the Society on or before the firſt Tueſday in December, 1796.

N. B. The Society are already in poſſeſſion of Cloth made in England from Hop-Stalks or Bines, which may be inſpected by application to the Regiſter.

201.

201. WICKS FOR CANDLES OR LAMPS. To the perſon who ſhall diſcover to the Society a method of manufacturing Hop-Stalks or Bines, or any other cheap material, the growth of England or Wales, ſo as to render them fit for the purpoſe of ſupplying the place of Cotton, for Wicks of Candles or Lamps, TWENTY GUINEAS.

SAMPLES, not leſs than five pounds weight, of the Wicks, ſo prepared, to be produced to the Society, with CERTIFICATES that the whole quantity is equal in quality to the Sample produced, on or before the ſecond Tueſday in January, 1797.

202. The ſame premium is extended one year further.

SAMPLES and CERTIFICATES to be produced on or before the ſecond Tueſday in January, 1798.

203. PAPER FROM RAW VEGETABLE SUBSTANCES. To the per-

ſon in England or Wales who ſhall make the greateſt quantity, not leſs than ten reams, of the beſt and moſt uſeful Paper, from Raw Vegetable Subſtances, TWENTY GUINEAS.

CERTIFICATES of the making ſuch Paper, and one ream of the Paper, to be produced on or before the firſt Tueſday in November, 1796.

N. B. The Society are in poſſeſſion of two volumes, containing a great variety of ſpecimens of Paper made from Raw Vegetables, viz. Thiſtles, Potatoe-Haum, Poplar, Hop-bines, &c. which volumes may be inſpected by any perſon, on application to the Regiſter.

204. MAINTAINING AND EMPLOYING THE POOR. To the perſon who ſhall produce to the Society, the beſt practical and moſt œconomical Plan for the maintenance and employment of the Poor in Pariſh Workhouſes, ſuperior to any hitherto

hitherto generally known, the GOLD MEDAL, or FIFTY GUINEAS.

The Plans to be delivered to the Society on or before the first Tuesday in March, 1797.

Premiums

Premiums for Inventions in Mechanicks.

205. TRANSIT INSTRUMENT. To the perſon who ſhall invent and produce to the Society a cheap and portable Tranſit Inſtrument, which may eaſily be converted into a Zenith Sector, capable of being accurately and expeditiouſly adjuſted for the purpoſe of finding the Latitudes and Longitudes of places, and ſuperior to any portable Tranſit Inſtrument now in uſe, the GOLD MEDAL, or FORTY GUINEAS.

To be produced on or before the laſt Tueſday in January, 1797.

206. TAKING WHALES BY THE GUN-HARPOON. To the perſon who, in the year 1796, ſhall ſtrike the greateſt number of Whales, not fewer than three, with the Gun-Harpoon, TEN GUINEAS.

Proper CERTIFICATES of the ſtriking ſuch Whales, and that they were actually taken in the year 1796, ſigned by the Maſter,

or

or by the Mate when the Claim is made by the Maſter, to be produced to the Society on or before the laſt Tueſday in December, 1796.

207. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the laſt Tueſday in December, 1797.

208. DRIVING BOLTS INTO SHIPS. To the perſon who ſhall invent and produce to the Society a Model, ſhewing a method of driving Bolts into Ships, particularly thoſe of Copper, without ſplitting the head or bending them, with more diſpatch, in all directions, and tighter than by any means hitherto known or in uſe, the GOLD MEDAL, or FORTY GUINEAS.

The Model, with CERTIFICATES that a Machine on the ſame conſtruction has been uſed to advantage, to be produced to the

the Society on or before the firſt Tueſday in February, 1797.

209. PORTABLE MACHINE FOR LOADING AND UNLOADING GOODS. To the perſon who ſhall produce an Invention to the Society, of the beſt, moſt ſimple, and portable Machine, ſuperior to any hitherto known, or in uſe, for the purpoſe of loading and unloading goods; the GOLD MEDAL, or FORTY GUINEAS.

The Machine itſelf, or a Model of it, to be delivered to the Society on or before the firſt Tueſday in January, 1797.

210. PARISH, OR FAMILY MILL. To the perſon who ſhall invent and produce to the Society, the beſt conſtructed Mill for grinding corn for the uſe of private families, or pariſh poor; the conſtruction to be ſuch as to render the working of the Mill eaſy and expeditious, and ſuperior to any hitherto in uſe; the GOLD MEDAL, or FORTY GUINEAS.

The

The Mill, and CERTIFICATES of its having been uſed to good effect, to be produced to the Society on or before the firſt Tueſday in February, 1797.

N. B. Cheapneſs and Simplicity will be conſidered as eſſential parts of its merit.

211. MACHINE FOR RAISING COALS, ORE, &c. &c. To the perſon who ſhall invent a Machine for raiſing Coals, Ore, &c. from Mines, which ſhall produce the effect at a leſs expence than thoſe already known or in uſe; the GOLD MEDAL, or FIFTY GUINEAS.

A Model of the Machine, made on a ſcale of not leſs than one inch to a foot, to be produced to the Society on or before the ſecond Tueſday in February, 1797.

212. MACHINE FOR RAISING WATER. To the perſon who ſhall invent a Machine on a better, cheaper, and more ſimple conſtruction than any hitherto known or in uſe, for raiſing Water out of

Wells, &c. from a depth not leſs than fifty feet, the GOLD MEDAL, or FORTY GUINEAS.

CERTIFICATES of the performance of the Machine, and a Model of it, on a ſcale of not leſs than one inch to a foot, to be produced to the Society on or before the firſt Tueſday in February, 1797.

213. MACHINE FOR RAISING WATER TO FLOAT PASTURE LAND. To the perſon who ſhall produce to the Society a model of the beſt conſtructed Machine, for raiſing Water from a ſtream, for the purpoſe of floating Paſture Land; the GOLD MEDAL, or FORTY GUINEAS.

The Model to be produced to the Society on or before the third Tueſday in February, 1797, with CERTIFICATES that a Machine on the ſame conſtruction, has been uſefully employed for the above purpoſes.

The more ſimple the conſtruction, and the leſs trouble and attendance the Machine

 requires,

requires, the greater merit will it be conſidered to poſſeſs.

214. PREVENTING WATER FREEZING IN PIPES. To the perſon who ſhall invent and diſcover to the Society a cheap and effectual Method, ſuperior to any hitherto in uſe, for preventing the Water freezing in Pipes, ſerving to ſupply dwelling-houſes or other buildings, the GOLD MEDAL, or THIRTY GUINEAS.

The ACCOUNTS, with proper CERTIFICATES of its having been tried with ſucceſs, to be delivered to the Society on or before the firſt Tueſday in March, 1797.

215. IMPROVEMENT OF WHEEL-CARRIAGES. To the perſon who ſhall diſcover to the Society the principles, and point out the conſtruction, upon which Wheel-carriages may be drawn with the leaſt fatigue to the horſe or horſes employed, the GOLD MEDAL, or FIFTY GUINEAS.

The

The CLAIMS to be delivered to the Society on or before the ſecond Tueſday in December, 1796.

216. PREVENTING HORSES TURNING ABOUT IN DRAWING WATER, &c. To the perſon who ſhall invent and produce to the Society a Model, on a ſcale of not leſs than one inch to the foot, ſhewing an eaſy, ſafe, and expeditious method to obviate the neceſſity of the horſes employed in raiſing Water out of deep Wells, drawing Ore from Mines, or Coals from Pits, turning about at the time the Water, Ore, or Coal is delivered; the GOLD MEDAL, or FORTY GUINEAS.

The Model to be produced to the Society, with CERTIFICATES of a Machine on the ſame conſtruction having been uſefully employed, on or before the firſt Tueſday in February, 1797.

217. BORING ROCKS IN ORDER TO BLAST THEM. To the perſon who

who ſhall diſcover to the Society, a more cheap, ſimple, and expeditious Method than any hitherto known or in uſe, of Boring Rocks in Mines, Shafts, Wells, &c. for the purpoſe of Blaſting them with Gunpowder, the GOLD MEDAL, or FORTY GUINEAS.

CERTIFICATES of the method having been practiſed with ſucceſs, with a full deſcription thereof, to be delivered to the Society on or before the firſt Tueſday in January, 1797.

218. *As the preſent method of cleanſing Chimneys is attended with great hardſhips, and ſometimes with fatal accidents to the children employed, and as the quantity of ſoot accumulated in Chimneys is frequently the occaſion of Fires, the Society propoſe to give the following Premium.*

CLEANSING CHIMNEYS. To the perſon who ſhall invent and produce to the Society, the moſt ſimple, cheap, and proper

Apparatus, ſuperior to any hitherto known or in uſe, for cleanſing Chimneys from Soot, and obviating the neceſſity of children being employed within the flues, in the manner now practiſed; the GOLD MEDAL, or FORTY GUINEAS.

The Apparatus, with CERTIFICATES of its having been uſed with proper effect, to be produced to the Society on or before the third Tueſday in February, 1797.

Premiums offered for the Advantage of the Britiſh Colonies.

219. NUTMEGS. For the greateſt quantity of merchantable Nutmegs, not leſs than ten pounds weight, being the growth of his Majeſty's dominions in the Weſt Indies, or any of the Britiſh Settlements on the Coaſt of Africa, or the ſeveral Iſlands adjacent thereto, and equal to thoſe imported from the Iſlands of the Eaſt Indies, the GOLD MEDAL, or ONE HUNDRED GUINEAS.

Satisfactory CERTIFICATES, from the Governor, or Commander in Chief, of the place of growth, with an account of the number of trees, their age, nearly the quantity of fruit on each tree, and the manner of culture, to be produced on or before the firſt Tueſday in December, 1796.

220. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the ſecond Tueſday in December, 1797.

221. CINNAMON. For importing into the port of London, in the year 1796, the greateſt quantity, not leſs than twenty pounds weight, of Cinnamon, being the growth of ſome of the Iſlands in the Weſt-Indies belonging to the Crown of Great-Britain, or any of the Britiſh Settlements on the Coaſt of Africa, or the ſeveral Iſlands adjacent thereto, and equal in goodneſs to the Cinnamon brought from the Eaſt-Indies, the GOLD MEDAL, or FIFTY GUINEAS.

SAMPLES, not leſs than two pounds weight, with CERTIFICATES that the whole quantity is equal in goodneſs; together with ſatisfactory CERTIFICATES, ſigned by the Governor, or Commander in Chief, of the place of growth, with an account of the number of trees growing on the ſpot, their age, and the manner of culture; to be produced to the Society, on

or before the firſt Tueſday in January, 1797.

222. The ſame premium is extended one year further.

The SAMPLES and CERTIFICATES to be produced on or before the firſt Tueſday in January, 1798.

223. CLOVES. For importing into the port of London, in the year 1797, the greateſt quantity of Cloves, not leſs than twenty pounds weight, being of the growth of ſome of the Iſlands in the Weſt-Indies, ſubject to the Crown of Great-Britain, or any of the Britiſh Settlements on the Coaſt of Africa, or the ſeveral Iſlands adjacent thereto, and equal in goodneſs to the Cloves brought from the Eaſt-Indies; the GOLD MEDAL, or FIFTY GUINEAS.

SAMPLES, not leſs than two pounds weight, with CERTIFICATES that the whole quantity is equal in goodneſs, together with ſatisfactory CERTIFICATES, ſigned

by the Governor, or Commander in Chief of the place of growth, with an account of the number of trees growing on the ſpot, their age, and the manner of culture, to be produced to the Society on or before the firſt Tueſday in January, 1798.

224. The ſame premium is extended one year further.

SAMPLES and CERTIFICATES to be produced on or before the firſt Tueſday in January, 1799.

225. PLANTATIONS OF BREAD-FRUIT TREE. To the perſon who ſhall have raiſed in any of the Iſlands of the Weſt-Indies ſubject to the Crown of Great Britain, or in any of the Britiſh Settlements on the Coaſt of Africa, or the ſeveral Iſlands adjacent thereto, between the firſt of January, 1795, and the firſt of January, 1796, the greateſt number of Bread-fruit Trees, not fewer than one hundred, and properly fenced and ſecured the ſame, in order to

ſupply

ſupply the Fruit to the Inhabitants, the GOLD MEDAL, or THIRTY GUINEAS.

Proper ACCOUNTS and CERTIFICATES, ſigned by the Governor or Commander in Chief, of the methods made uſe of in cultivating the Plants and ſecuring the Plantation, and that the Trees are in a growing and thriving ſtate at the time of ſigning ſuch Certificates, to be produced to the Society on or before the firſt Tueſday in January, 1797.

226. The ſame premium is extended one year further.

The ACCOUNTS and CERTIFICATES to be produced on or before the firſt Tueſday in January, 1798.

227. The ſame premium is extended one year further.

The ACCOUNTS and CERTIFICATES to be produced on or before the firſt Tueſday in January, 1799.

228. The ſame premium is extended one year further.

The ACCOUNTS and CERTIFICATES to be produced on or before the firſt Tueſday in January, 1800.

229. KALI FOR BARILLA. To the perſon who ſhall have cultivated, in the Bahama Iſlands, or any other part of his Majeſty's dominions in the Weſt Indies, or any of the Britiſh Settlements on the Coaſt of Africa, or the ſeveral Iſlands adjacent thereto, in the year 1793, the greateſt quantity of land, not leſs than two acres, with Spaniſh Kali, fit for the purpoſe of making Barilla, the GOLD MEDAL, or THIRTY GUINEAS.

230. For the next greateſt quantity, not leſs than one acre, the SILVER MEDAL, or FIFTEEN GUINEAS.

CERTIFICATES, ſigned by the Governor, or Commander in Chief for the time being, of the quantity of land ſo cultivated, and of the ſtate of the Plants at the time of

of ſigning ſuch Certificates, to be delivered to the Society on or before the ſecond Tueſday in November, 1796.

231, 232. The ſame premiums are extended one year further.

CERTIFICATES to be produced on or before the ſecond Tueſday in November, 1797.

233, 234. The ſame premiums are extended one year further.

CERTIFICATES to be produced on or before the ſecond Tueſday in November, 1798.

235. DISCOVERY OF A PASSAGE BY LAND FROM UPPER CANADA TO THE SOUTH SEA. To the perſon who ſhall firſt diſcover a Paſſage by Land, from the north-weſt parts of Upper Canada to the South Sea, between Nootka Sound and the Straits of Kamſchatka, or to the navigable part of any River that diſembogues

embogues itſelf into the South Sea within thoſe limits; the GOLD MEDAL.

Such diſcovery to be aſcertained by a CERTIFICATE under the hand and ſeal of the Governor, or Commander in Chief for the time being, of the ſaid province of Upper Canada.

236. DESTROYING THE INSECT COMMONLY CALLED THE BORER. To the perſon who ſhall diſcover to the Society an effectual method of deſtroying the Inſect commonly called the BORER, which has of late years been ſo deſtructive to the Sugar-Canes in the Weſt-India Iſlands, or in any of the Britiſh Settlements on the Coaſt of Africa, or the ſeveral Iſlands adjacent thereto, the GOLD MEDAL, or FIFTY GUINEAS.

The Diſcovery to be aſcertained by ſatisfactory CERTIFICATES, under the hand or ſeal of the Governor or Commander in Chief for the time being, and of ſome other reſpectable perſons, inhabitants of the Iſlands

Iſlands, or other place, in which the remedy has been ſucceſsfully applied; ſuch CERTIFICATES to be delivered to the Society on or before the firſt Tueſday in January, 1797.

237. The ſame premium is extended one year further.

CERTIFICATES to be delivered on or before the firſt Tueſday in January, 1798.

238. BOTANIC GARDEN IN THE BAHAMA ISLANDS. To the perſon who, before the firſt of January, 1795, ſhall have ſet apart, and properly fenced and cultivated, the greateſt quantity of ground, not leſs than five acres, in any of the Bahama Iſlands, as a Botanic Garden, for the purpoſe of making experiments in the culture of thoſe articles which are the peculiar production of the tropical climates, and which may tend to promote the commerce and manufactures of this country; the GOLD MEDAL, or ONE HUNDRED GUINEAS.

It is required that any perſon claiming the foregoing premium, ſhould produce to the Society, on or before the firſt Tueſday in January, 1797, a CERTIFICATE from the Governor or Commander in Chief of the Bahama Iſlands for the time being, of his having complied with the above requiſitions, and that the Garden is in a proper ſtate of culture at the time of ſigning ſuch Certificate.

239. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in January, 1798.

240. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in January, 1799.

Society's Office, Adelphi, June 1, 1796.

Ordered,

THAT THE SEVERAL CANDIDATES AND CLAIMANTS TO WHOM THE SOCIETY SHALL ADJUDGE PREMIUMS OR BOUNTIES, DO ATTEND AT THE SOCIETY'S OFFICE IN THE ADELPHI, ON THE LAST TUESDAY IN MAY, 1797, AT TWELVE O'CLOCK AT NOON, TO RECEIVE THE SAME; THAT DAY BEING APPOINTED BY THE SOCIETY FOR THE DISTRIBUTION OF THEIR REWARDS: AND BEFORE THAT TIME NO PREMIUM OR BOUNTY WILL BE DELIVERED, EXCEPTING TO THOSE WHO ARE OUT OF THE KINGDOM, OR PREVENTED BY UNAVOIDABLE ACCIDENTS.

IN CASES WHERE THE SOCIETY MAY THINK FIT TO ADMIT EXCUSES FOR NOT ATTENDING IN PERSON, DEPUTIES MAY BE SUBSTITUTED TO RECEIVE THE REWARDS, PROVIDED SUCH DEPUTIES ARE EITHER MEMBERS OF THE SOCIETY, OR THE SUPERIOR OFFICERS THEREOF.

GENERAL

GENERAL CONDITIONS.

NOTWITHSTANDING the Society reſerve to themſelves the power of giving, in all caſes, ſuch part only of any Premium as the Performance ſhall be adjudged to deſerve, or of withholding the whole, if there be no merit; yet the Candidates may be aſſured the Society will always judge liberally of their ſeveral claims.

It is required that the matters for which Premiums are offered, be delivered in without names, or any intimation to whom they belong; that each particular thing be marked in what manner each Claimant thinks fit, ſuch Claimant ſending with it a paper ſealed up, having on the outſide a correſponding mark, and on the inſide the Claimant's name and addreſs: and all Candidates are to take notice, that no claim for a Premium will be attended to, unleſs the conditions of the Advertiſement are fully complied with.

No

No Papers ſhall be opened, but ſuch as ſhall gain Premiums, unleſs where it appears to the Society abſolutely neceſſary for the determination of the Claim; all the reſt ſhall be returned unopened, with the Matters to which they belong, if inquired after by the Mark, within two years; after which time, if not demanded, they ſhall be publicly burnt, unopened, at ſome meeting of the Society.

All Models of Machines, which obtain Premiums or Bounties, ſhall be the property of the Society.

All the Premiums of this Society are deſigned for Great Britain, unleſs expreſsly mentioned to the contrary.

The Claims ſhall be determined as ſoon as poſſible after the delivery of the ſpecimens.

No perſon ſhall receive any Premum, Bounty, or Encouragement, from the Society, for any matter for which he has obtained, or propoſes to obtain, a patent.

A Candidate for a Premium, or a perſon applying for a bounty, being detected in any

any diſingenuous method to impoſe on the Society, ſhall forfeit ſuch Premium or Bounty, and be deemed incapable of obtaining any for the future.

The Performances which each year obtain Premiums or Bounties, are to remain with the Society until after the public diſtribution of Rewards.

No member of this Society ſhall be a Candidate for, or entitled to receive, any Premium, Bounty, or Reward whatſoever, except the Honorary Medal of the Society.

Where Certificates are required to be produced in claim of Premiums, they ſhould be expreſſed, as nearly as poſſible, in the words of the reſpective advertiſements, and ſhould not be from the Candidate (ſolely), but from ſome other perſon or perſons who have a poſitive knowledge of the facts certified.

Where Premiums or Bounties are obtained in conſequence of ſpecimens produced, the Society mean to retain ſuch part of thoſe ſpecimens as they may judge neceſſary,

ceſſary, making a reaſonable allowance for the ſame.

No candidates ſhall be preſent at any meetings of the Society or Committees, or admitted at the Society's Rooms, after they have delivered in their Claims, until ſuch Claims are adjudged, unleſs ſummoned by the Committee.

N. B. Any information or advice that may forward the deſigns of this Society for the public good, will be received thankfully, and duly conſidered, if communicated by letter, addreſſed to the Society, and directed to Mr. More, the Secretary, at the Society's Office, in the Adelphi Buildings, London.

*** In case any person should be inclined to leave a sum of money to this Society, by will, the following form is offered for that purpose:

Item. I give and bequeath unto A. B. and C. D. the sum of upon condition and to the intent that they, or one of them, do pay the same to the Collector for the time being, of a Society in London, who now call themselves the Society for the Encouragement of Arts, Manufactures, and Commerce; which said sum of I will and desire may be paid out of my personal estate, and applied towards the carrying on the laudable designs of the Society.

By order of the Society,

SAMUEL MORE, Secretary.

PAPERS

IN

AGRICULTURE.

AGRICULTURE.

IN conſequence of the following Account and Certificates having been received, the GOLD MEDAL, being the Premium offered for ſowing ACORNS, for the purpoſe of raiſing OAKS for TIMBER, was this Seſſion adjudged to JAMES DENTON, Eſq.

SIR,

BEING deſirous to obtain the honorary Premium offered by the Society for the Encouragement of Arts, Manufactures, and Commerce, for the Improvement of Planting, I have encloſed a Certificate, which I beg to have the honour to lay before them for their approbation.

I am, SIR,

Your moſt obedient humble Servant,

JAMES DENTON.

Brandon,
October 30, 1795.

Mr. MORE.

THIS is to certify, that James Denton, of Brandon, in the Counties of Norfolk and Suffolk, Eſq. planted ten acres three roods of land with Acorns, on his eſtate at Feltwell, in Norfolk, part broad-caſt, and the other drilled, two buſhels on each acre, in the months of October, November, and December, 1794; and that there are now more than three hundred young Oaks on each acre. In the ſame months planted the ſame ground with more than one thouſand ſeven hundred larch and ſpruce firs and beech-trees on each acre; alſo planted twenty-ſeven acres one rood of land with Acorns, not leſs than one thouſand five hundred Acorns on each acre, which were dibbled into a plantation of larch, ſpruce firs, and other trees, planted in the years 1791, 1792, and 1793.—There are now growing upwards of one thouſand five hundred larch, ſpruce firs, and beech-trees, on each acre; and that, upon a view taken by us three days previous to the date hereof, the plants were in a thriving ſtate and good condition, and well fenced in every part.

Witneſs our hands, the thirtieth day of October, 1795,

HENRY PRITCHARD, Rector of Feltwell.

THOMAS AYLMER, Churchwarden of Feltwell.

SAMUEL ELLINGTON, Gardener, who ſet the above.

WILLIAM WEBB, Land-Surveyor, who ſurveyed the above land.

GENTLEMEN,

I HEREBY acknowledge my ſignature to a Certificate, purporting that James Denton, Eſq. in the pariſh of Feltwell, did plant ten acres three rood of land, and alſo twenty-ſeven acres and one rood, with Acorns, in the months of October, November, and December, in the year 1794, and which are now in a very flouriſhing ſtate.

I am happy, Gentlemen, to bear witneſs a ſecond time to ſo expanded an act, which has not only rendered a large tract of here-

tofore-barren ſoil, an object of great future utility, but of ſingular beauty to the ſurrounding country.

I have the honour to be,

GENTLEMEN,

Your very humble ſervant,

HENRY PRITCHARD,
Rector of Feltwell, in the County of Norfolk.

The

The GOLD MEDAL, being the firſt Premium offered for raiſing OAKS, was this Seſſion adjudged to the Rev. JOHN ROBERT LLOYD, of Aſton, near Oſweſtry, Salop, from whom the following Account and Certificates were received.

SIR,

I TAKE the liberty of requeſting you to acquaint the Society for Encouragement of Arts, Manufactures, and Commerce, that I laſt ſeaſon made a plantation of Oaks in a field well fenced, and ſecured from treſpaſs, which are now in a healthy ſtate, and likely to grow faſt.

The whole number was ſixty thouſand and twenty, of four-year-old plants, which had been raiſed in my nurſery, fifty-eight thouſand four hundred of which were planted between the 24th of November, 1793, and the nineteenth day of the following month; and in the ſpring 1794, befor the 22d day of March, the remaining one thouſand ſix hundred and twenty were planted: the ground

ground had been fallowed and well manured for wheat, and after the harveſt 1793, the holes were immediately made for the Oaks: when the plantation was nearly completed, nine thouſand three hundred two-years-old Scotch firs were likewiſe put into the ground, under the ſuppoſition of their becoming a ſhelter to the Oaks, and to be cut away upon the firſt thinning; and I muſt alſo mention, that the field I ſelected is of a nature particularly ſuited to Oaks, and that it has been remarkably well drained and guttered, to prevent any water lodging upon it, to the injury of the young trees. The plantation will meaſure, within the fence, at leaſt fourteen acres. Underneath you will ſee the Certificate of my gardener, which I hope will be ſatisfactory to the Committee, eſpecially as I have had the honour of ſhewing you the plantation alluded to; but, if any other teſtimony ſhould be required, I ſhall be happy to ſend it you. I cannot help entertaining a wiſh that I may be a ſucceſsful Candidate for the Medal, as I have ſpared neither expence nor trouble

trouble to execute the work in as perfect a manner as poſſible.

I am, SIR,

Your obedient humble Servant,

J. R. LLOYD.

Aſton, October 26, 1795.

Mr. MORE.

I HEREBY certify, that the foregoing ſtatement of trees planted by the Rev. J. R. Lloyd, of Aſton, in the county of Salop, is accurate in every reſpect, as I attended the whole of the buſineſs, and made memorandums daily during its progreſs.

J. FAYEL, Gardener to the Rev. J. R. LLOYD.

P. S. I have, as it may perhaps ſave trouble, requeſted the clergyman of the adjoining pariſh to certify, that a plantation as before deſcribed has been made.

I WILLIAM DAVIES, Clerk, Vicar of Saint Martin's, in the county of Salop, do hereby certify, that a plantation of Oaks has been made by the Rev. John Robert Lloyd, of Aſton, according to the manner deſcribed by him in the foregoing letter, and that I firmly believe every ſtatement made by him therein to be perfectly accurate.

W. DAVIES.

Saint Martin's,
October 26, 1795.

The

The SILVER MEDAL was this Seſſion voted to THOMAS RICHARDSON, of Handale Abbey, in the North Riding of Yorkſhire, Eſq. as a token of the Society's approbation of his ſpirited conduct in forming the Plantation, although, from the Papers not having been received in due time, he could not be conſidered as entitled to the Premium offered for making ſuch plantations.

SIR,

THE Society inſtituted for the Encouragement of Arts, Manufactures, and Commerce, having offered a Premium of a Gold Medal for planting the greateſt number of mixed Timber-Trees, I beg leave to become a candidate for the truly honourable prize, having planted, from the month of October, 1789, to the end of February, 1791, upon forty acres of land, within my eſtate, one hundred and twenty-one thouſand four hundred and thirteen Timber-Trees of various kinds, and encloſed the whole by a quick-hedge of hawthorn;

the particulars of which, with their healthy growing ſtate at this time, will be more fully explained and proved in the Certificate encloſed in the paper ſuperſcribed Silva.

My LORDS and GENTLEMEN,

HAVING purchaſed the eſtate of Handale Abbey, in the North Riding of Yorkſhire, on which there were about forty acres of land which had been formerly full of Timber-Trees, but which were for the moſt part cut down and deſtroyed, very little remaining but the underwood, and this overrun and browzed upon by the cattle, the fences being entirely thrown down, and the whole ſo much neglected, as to give no promiſe whatever of any wood riſing from the old ſtocks, even if the whole was again encloſed; in this ſituation I immediately formed my reſolution of planting the whole afreſh; and, notwithſtanding the expence which ſeemed likely to accrue from the great length I ſhould have to encloſe and ſecure with good fences, it being a narrow

narrow ſlip of land in form of a creſcent, on the declivities of the hills deſcending into a valley, one fourth part round the eſtate, yet I was not from this conſideration driven from my purpoſe, being convinced that it would grow excellent Timber, and produce in time more profit than could be expected from cultivating the land. I therefore began to plant it in October, 1789, with mixed Timber-Trees, of the following kinds:—Oak, Aſh, Elm, Beech, Sycamore, Alder, Larch-Fir, Spruce-Fir, Scotch-Fir, the white Dutch Poplar, and the black Carolina Poplar, diſpoſing each plant in the ſoil beſt adapted to its growth; by the end of February, 1791, I had completed the whole, which contained one hundred and twenty-one thouſand four hundred and thirteen trees, around which I planted a fence of hawthorn, ſecured by an outer fence, compoſed in part of poſts and rails, and part of ſtake and band hedge. I have the ſatisfaction to ſay, that the trees are in a very healthy thriving condition, moſt of them indeed are remarkably luxuriant; and having kept the hedge clean, it is

now

now become a very good fence, as is proved in the incloſed Certificate. I am, with the greateſt reſpect,

My LORDS and GENTLEMEN,

Your obedient humble ſervant,

THOMAS RICHARDSON.

Mancheſter,
October 24, 1795.

Mr. MORE.

HAVING worked for ſome time in the plantations at Handale Abbey, I do hereby certify, that the trees planted therein are in a moſt flouriſhing condition: as a proof of this aſſertion, there are ſome white Dutch Poplars which were planted in February, 1791, and were then no more than two feet high, and not two inches in circumference, which I meaſured this day, and they are now twenty inches and a quarter in circumference at the bottom, and eighteen inches in circumference a foot from the ground, and twenty-ſix feet four inches high. Theſe plants were ſent from Mancheſter, a diſtance of one hundred and twenty miles, there

there not being any of the kind before in this part of the country that I know of; and Thomas Richardſon, Eſq. was deſirous of introducing them here, thinking they would ſucceed very well, and the reſult has proved his opinion to be right. This tree grows ſo very well in different ſituations in the wood, that we propagate numbers of them in the nurſery every year, which are eaſily raiſed from cuttings ſtuck in the ground when well trenched.

THOMAS GOODLAD, Gardener.

Staithes,
October 24, 1795.

I DO hereby certify that Thomas Richardſon, Eſq. planted on his eſtate at Handale Abbey, in the North Riding of the county of York, from the winter of 1789 to the end of February 1791, one hundred and twenty-one thouſand four hundred and thirteen trees of various kinds; and encloſed the whole with a living hedge of hawthorn, of the length of ſix hundred and eighty-one rods, of ſeven yards to the rod, which I

measured in conjunction with the Rev. Mr. Harrison, curate of Lofthouse. I have daily oportunities of viewing this plantation and enclosure, which has grown extremely well, many of the trees indeed surprisingly: the hedge is kept with the utmost neatness, and is already become an excellent fence, and, from the cleanness with which it is kept, forms abeautiful scene around the wood.

GEORGE SANDERSON.

Handale Abbey,
October 23, 1795.

The

The following Account having been received from LEWIS MAJENDIE, of Hedingham-Caſtle, Eſſex, Eſq. TWENTY GUINEAS, being the Premium offered for the Culture of BEANS and WHEAT, was this Seſſion adjudged to him.

SIR,

THE Society for the Encouragement of Arts, Manufactures, and Commerce, having thought fit to offer a Premium to the perſon who ſhall have planted or drilled, between the firſt of December, 1793, and the firſt of April, 1794, the greateſt quantity of land (not leſs than ten acres), with Beans, and ſhall have ſown the ſame land with Wheat, in the ſame year 1794; I am induced to ſubmit the following account to the inſpection of the Society, in which it will be found, that fifteen acres of land, part of my farm, have been cultivated preciſely after the manner preſcribed by their conditions.

Two fields, the one of eight, the other of ſeven acres, were planted with Beans in the month of February, 1794; the ſoil of the former field is a tender clay; of the latter, a rich mouldy earth, it having only been three years under the plough, and, previous to this, a paſture beyond memory. The Beans, which which were of that ſmall ſpecies called Horſe Beans *(vicia faba equina)*, were planted in the Norfolk mode, by children dropping them ſingly into holes, made on the ſoil with iron hand-dibbles, in rows about one foot aſunder, and with a diſtance of four inches between the holes in the rows: this proceſs is doubtleſs ſo well known to the Society, as to need no further explanation in this place. The quantity of ſeed planted on each acre was ſix pecks; and the total expence, in dibbling, dropping, ploughing, harrowing, ſeed, hand-hoeing, reaping and thraſhing, was twenty-nine pounds, fourteen ſhillings, and threepence, or one pound, nineteen ſhillings, and ſevenpence farthing, per acre.

The crops from theſe fields were reaped, and bound inſmall ſheaves or bundles, which were

were ſet up to dry in ſeparate parcels, each of four ſheaves; the reaping began on the 18th of Auguſt, 1794, and was continued, as the weather ſuited, till the end of that month.

On the 4th and 5th of September, the crop, from the field of ſeven acres, was carried in fifteen large waggon loads; and the field of eight acres was carried alſo in fifteen waggon-loads, by the 13th of the ſame month.

The produce of both fields was ſo carefully ſeparated in the barns, as to prevent any miſtake being made in the amount of either.

That from the field of eight acres was twenty-nine quarters, one coomb, and three buſhels, or twenty-nine buſhels, three pecks, and eight pints, per acre.

That from the field of ſeven acres was twenty nine quarters and two buſhels, or thirty-three buſhels, one peck, and eleven pints, per acre.

The whole quantity of Beans produced from theſe fifteen acres, was fifty-nine quarters and one buſhel, which were ſold for

one hundred and twenty pounds, eleven ſhillings, and ſixpence.

The Bean ſtraw was uſed as litter in the winter 1794, for ſeveral beaſts which were fattening on cabbages in the yard, adjoining the barns in which the Beans were thraſhed; by this means a great quantity of manure was made, which has ſince been carted out upon a large heap of earth and chalk, and now forms a rich and highly valuable compoſt for the future benefit of the farm.

Upon theſe fields, and with one earth or ploughing, Wheat was ſown broad-caſt between the 13th and 18th of October, 1794, and the reſulting crops completely harveſted on the 5th of September, 1795.

The ſame caution was uſed in ſeparating the crops as on the former occaſion; and the thraſhing of both being now fully completed, I am enabled to inform the Society of the exact produce of Wheat from each field.

The field of eight acres has produced twenty-five quarters, one coomb, and three buſhels, or per acre, twenty-five buſhels, three pecks, and eight pints.

The field of ſeven acres has produced thirty-four quarters and two buſhels, or thirty-nine buſhels and nine pints per acre.

The great comparative fertility in this field, it ſhould however be remembered, is to be aſcribed to the ſmall length of time it has been under the plough, and that this is the firſt crop of Wheat from it within the memory of man.

I have tranſmitted for the Society's inſpection, a ſmall ſample of Beans, the produce from theſe fields in 1794, and two buſhels of the Wheat from the preſent crops, for their acceptance, which laſt might ſeem indeed unneceſſary, but that, from the whiteneſs of its flower, and thinneſs of its bran, I conceive it not unworthy of their attention, eſpecially as it is not yet too late to be diſtributed and ſown in the preſent ſeaſon.

The ſtock from which this Wheat is produced was purchaſed by me two years ſince, from Mr. William Pollet, a very ingenious and active farmer, in the pariſh of Great Bardfield, in this county, who, a few years ago, paid ſingular attention to the various colours obſervable in the bloſſoms or an-

thera of Wheat, when in complete efflorescence: he noticed on his farm several ears whose blossoms were of different colours; these he reserved apart when ripe, and then patiently cultivated the seed arising from them in separate spots in his garden; the result has been a very high opinion of the present variety, of which he has since raised a considerable quantity.*

Such is the present good opinion entertained in my neighbourhood of this Wheat, that the greater part of the produce from these fields (except what was reserved to sow on my farm) has been eagerly purchased for seed.

I have the honour to be,

SIR,

Your very obedient humble servant,

LEWIS MAJENDIE.

Hedingham-Castle, Essex,
November 3, 1795.

Mr. MORE.

Expences

* This circumstance is noticed in page 25 of the General View of the Agriculture of the County of Essex, drawn up by Mr. Charles Vancouver, for the consideration of the Board of Agriculture and internal irmpovement.

Expences attending the Bean Culture in Great Caſtle Field, containing Eight Acres, and in Cox Field, containing Seven Acres, (in the whole Fifteen Acres), in the year 1794, which Fields were ſown with Wheat at the end of the ſame year.

			s.	*d.*	*l.*	*s.*	*d.*
1794 February.	To Charles Green Brighton, for 7 days work as dibbler in Cox Field -	at	1 6	-	0	10	6
	To ditto, for ſeven days and one half, in Great Caſtle Field -	at	1 6	-	0	11	3
	To ſundry children dropping Beans - -				2	2	5
	To ploughing 15 acres, at 5s. per acre -				3	15	0
	To buſh-harrowing 15 acres -	at	0 3	-	0	3	9
	To 25 buſhels Horſe-beans,	at	6 0	-	7	10	0
March 25 to June 26	To hand-hoeing 15 acres three times -	at	10 6	-	7	17	6
Auguſt 18	To reaping 15 acres	at	5 0	-	3	15	0
Nov. 3 to Dec. 24	To thraſhing 59 quarters 1 buſhel of Beans	at	1 2	-	3	8	10
					£29	14	3

Amount

Amount of the Produce and Sale of the Beans grown in Great Caſtle Field, containing eight Acres, in 1794.

1794	Qrs.	C.	B.	P.			£.	s.	d.
November 3	16	1	2	0	ſold to Joſeph Tomlinſon, —	at 42s.	35	3	6
	0	0	1	2	refuſe beans reſerved for home uſe	at 4s. per buſh.	0	6	0
22	0	0	3	2	ditto — —	at 4s.	0	14	0
25	0	1	0	0	ſold to Ann Kent — —	at 5s.	1	0	0
28	12	0	0	0	ſold Mr. Tabor, at Colcheſter —	at 41s.	24	12	0
	29	1	3	0			£.61	15	6

Amount of the Produce and Sale of the Beans grown in Cox Field, containing ſeven Acres, in 1794.

1794	Qrs.	C.	B.	P.			£.	s.	d.
December 5	13	0	0	0	ſold to Mr. Tabor, at Colcheſter	at 41s. per quarter	26	13	0
11	2	0	0	0	ditto — —	at 41s.	4	2	0
1795	0	0	2	0	reſerved for home uſe (refuſe) —	at 4s. per buſh.	0	8	0
January 11	14	0	0	0	ſold Mr. Green, at Colcheſter —	at 39s. 6d. per qr.	27	13	0
	29	0	2	0			£.58	16	0

Rotation of Crops for Six Years.

GREAT CASTLE FIELD (EIGHT ACRES.)		COX FIELD (SEVEN ACRES.)	
1790	Barley	1790	Paſture, beyond memory
1791	White Oats and Clover	1791	Black Oats
1792	Clover	1792	White Oats
1793	Wheat	1793	Barley
1794	Beans	1794	Beans
1795	Wheat	1795	Wheat

I, CHARLES GREEN BRIGHTON, Game-keeper to Lewis Majendie, of Hedingham Caſtle, in the county of Eſſex, Eſq. do hereby certify, that in the month of February, 1794, two fields, called Great Caſtle Field, containing eight acres, and Cox Field, containing ſeven acres, part of the farm of the ſaid Lewis Majendie, Eſq. were planted with Horſe Beans in the Norfolk manner, by dibbling; the whole of the dibbling being done by me, and the Beans dropped into the holes by children: that the quantity of ſeed ſown to each acre was ſix pecks, that the Beans were duly harveſted, and the produce from each field ſeparated in the barn. And I further certify, that at the cloſe of the year 1794 the above-mentioned fields were ſown with Wheat.

CHARLES G. BRIGHTON,
Game-keeper to Lewis Majendie, Eſq.

Hedingham Caſtle,
November 3, 1795.

I, BARKER MYALL, Churchwarden of the pariſh of Caſtle Hedingham, in the county

county of Eſſex, do hereby certify, that in the year 1794 I frequently ſaw two fields, named Great Caſtle Field, containing eight acres, and Cox Field, containing ſeven acres, part of the farm of Lewis Majendie, Eſq. that they were ſown with Beans in the early part of the year, and with Wheat at the cloſe of the ſame year; that I have examined the minutes and accounts kept by Mr. Majendie during the growth of both crops, and do verily believe the facts ſtated by him, as alſo the contents of the annexed Certificate, ſigned Charles Green Brighton, to be ſtrictly true.

BARKER MYALL,
Churchwarden of the pariſh of Caſtle Hedingham.

Caſtle Hedingham, Eſſex,
November 3, 1795.

Mr. MORE.

The

The GOLD MEDAL, or FIFTY GUINEAS, being the Premium offered for cultivating POTATOES on the greateſt quantity of Land, not leſs than twenty acres, ſuch Land not having been planted with Potatoes within the laſt ten years, was this Seſſion adjudged to JOHN KINGSTON, of Oak Hill, near Barnet, Herts, Eſq. who made choice of the Pecuniary Reward, and from whom the following Papers were received.

SIR,

WITH this you will receive a Certificate of the quantity of land cultivated by me laſt year with Potatoes: two thirds of the ſaid land was a light gravelly ſoil, and the other a ſtrong clay; about four acres were planted in the manner recommended by the Board of Agriculture laſt year,* one acre

* The mode alluded to, as recommended by the Board of Agriculture, was to draw furrows in the prepared ground, about three feet aſunder; in thoſe furrows the dung (about fifteen large loads to the acre) was laid, then the ſets were dropped on the dung, about nine inches aſunder, and covered by the plough.

acre in the lazy-bed way, and the remainder in the uſual manner, dropping the ſets in the furrows after the plough, and earthing them up as the plough returned. The produce of the firſt was by much the fineſt, but not quite ſo abundant as the latter; that of the lazy-bed was not ſo much as either; but after the Potatoes were taken up with forks, the ground was in fine dry condition for dibbling in Wheat, which now looks exceedingly healthy and fine, and took only a peck and a half of ſeed to the acre.

I am perſuaded that no Premium has ever been offered by the Society in the agricultural way, that will be attended with ſuch general advantage to the country as that for encreaſing and improving the growth of Potatoes; as it will (if the Premiums are continued) bring into cultivation thouſands of acres that the owners would never have thought of cultivating without ſuch encouragement: and to render it more generally beneficial, I beg leave to ſuggeſt, that were the Premiums to begin with a lower quantity of land, it would induce a great many little

farmers

farmers to cultivate from five to ten acres, who cannot ſpare dung and labour for more; * and were the claimants obliged to lay not leſs than ten loads of dung on each acre, it would be the beſt preparation in the world for Wheat, which ought to be ſown as ſoon as the Potatoes are got out.

I am, Sir,

Your moſt obedient humble ſervant,

JOHN KINGSTON.

January 19, 1796.

Mr. MORE.

WE, John Pratt, Bailiff to John Kingſton, Eſq. of Oak Hill, in the pariſh of Eaſt Barnet, in the county of Hertford, and William Robinſon, Ploughman to the ſame, do hereby certify, that we cultivated on the farm of the ſaid John Kingſton, at Oak Hill aforeſaid, twenty-four acres of land, formerly wood and chaſe land, in

* See the Conditions for the Premiums offered this Seſſion for encreaſed Culture of Potatoes, page 33.

in the year 1795; ſuch land not having been planted with Potatoes within the laſt fourteen years, as the ſaid William Robinſon is ready to atteſt on oath, if required. Witneſs our hands, this 18th of January, 1796.

JOHN PRATT,

WILLIAM ROBINSON.

In conſequence of the following Papers and Certificates relative to the culture of RHUBARB, the GOLD MEDAL, being the Premium offered for that article, was this Seſſion adjudged to Mr. ROBERT DAVIS, of Minehead, Somerſetſhire.

An Account of the ſoil, culture, and aſpect, of the Plantation of Rheum Palmatum, or true Rhubarb, conſiſting of nine hundred and thirteen plants.

THE ſoil on which they now ſtand is light, but not what may be termed a light black ſoil. The ground is a ſpot in a field quite open to all parts, and without any declivity. The ſeeds were ſown very thick about the month of July, 1786, in a ſmall ſpot in a garden, where they remained till the following March, when the roots were all taken up, and tranſplanted at the diſtance of ſix inches; here they remained till the following ſpring, when I cauſed the ground where they now ſtand, being then a fallow, to be ploughed, and, at the diſtance

of four feet, pits to be dug two feet deep, and to be filled again with one half rotten dung, and the other half the earth taken out of the ſaid pits, and ſifted; thus raiſing the ſame four inches above the common level, to allow for ſinking: I then planted one thouſand and fifty three plants or roots. During the firſt ſummer and winter, a very conſiderable number of plants, from ſome unknown cauſe, died; and in the next ſpring, having a quantity of roots left in my plantation bed, I filled up all the vacancies completely; ſince which time to the preſent, one hundred and forty plants have died, and nine hundred and thirteen are ſtill alive and flouriſhing. I can give no account of the cauſe of any of their decay, but imagine it to have been occaſioned from the rains in winter. I conſtantly kept the land clean from weeds, by hoeing, and have no other trouble with it.

ROBERT DAVIS.

Minehead,
September 29, 1795.

THIS

THIS is to certify, that we, William Hill, and Anthony Mogford, gardeners and labourers, of Minehead, did assist Robert Davis, of this place, in preparing the ground to plant out one thousand and fifty-three plants of the Rheum Palmatum, or true Rhubarb; and which were planted out accordingly, at the distance of four feet from each other. One hundred and forty of those plants, have, from unknown circumstances, since died: there are now standing and growing, in a thriving condition, and have been so during the last summer, nine hundred and thirteen of the said plants. Witness our hands,

WILLIAM HILL,
ANTHONY MOGFORD.

Minehead,
September 29, 1795.

WE whose names are hereunto subscribed, being gentlemen, and residents in the town of Minehead, in the county of Somerset, do hereby certify, that Robert Davis, of the same place, has, in a

piece of ground in this parish, a plantation of Rheum Palmatum, or true Rhubarb, consisting of nine hundred and thirteen plants, at the distance of four feet from each other; all which plants were in a thriving condition during the last summer.

PHILIP BALL,
FRANCIS BLAKE,
JOHN JENKINS,
PETER PRIEST.

Minehead,
September 29, 1795.

The

In consideration of the merit of the Rhubarb mentioned in the following Papers (samples of which are reserved in the Society's Repository), the Society have this Session voted their SILVER MEDAL to NICHOLAS ASHTON, of Woolton Hall, near Liverpool, Esq.

SIR,

THE beginning of this month I ordered my gardener to take up four roots of Rhubarb, which I received about sixteen years ago from Orford, in this county. After being cleared from the soil, I had the curiosity to weigh them; and, although from their age and want of a sufficiency of soil (it being only two feet deep before the roots touched the red rock), which caused the principal tap root to decay, yet the sound roots, so cleared, weighed seventy-three pounds. After causing the bark to be pared off the large roots, and scraped off the small ones, I directed the whole to be cut into pieces, and laid upon

the flue of one of the ſucceſſion houſes of my pinery, with a ſmall fire to dry the Rhubarb gradually: it has dried it much to my wiſhes; and this day, being perfectly cured, the roots weighed, in their preſent dry ſtate, fourteen pounds and a half, and the bark three pounds and a half.—This amazing decreaſe of weight has rather diſappointed me; but I mention theſe particulars, as you wiſhed to be informed how I ſucceeded; and it gives me no little pleaſure to find that Rhubarb of ſo good quality, and with ſo little trouble, can be raiſed in this country.

I firmly believe that the four roots above mentioned would have produced an equal quantity of Rhubarb, had they been taken up ten years ago, if they had been planted in a deeper ſoil. They were continued in my garden for ſo long a ſpace, as ornamental and curious plants, being the Rheum Palmatum; they flowered very ſtrong, and perfected their ſeeds, which, until laſt year, the gardener had diſregarded.

I have now gathered a conſiderable quantity, and, if the Society think it an object, will order a field to be prepared, and planted out next ſpring; and you will be kind enough to adviſe me, whether to ſow the ſeeds this month, or in February. If it is deſired, I will ſend the Society the whole produce of my four roots by the mail coach, for inſpection, the firſt Tueſday in November. With reſpect to the culture, the Rhubarb was planted in 1778 or in 1779, in good vegetable ſoil, in my garden, and remained undiſturbed, but kept clear from weeds, until October, 1795, when it was taken up and cured, as mentioned in this letter.

I am, SIR,

Your very humble Servant,

NICHOLAS ASHTON.

Woolton Hall, near Liverpool,
October 22, 1795.

Mr. MORE.

The GOLD MEDAL, being the Premium offered for gaining and ſecuring Land from the Sea, was this Seſſion adjudged to Mr. RICHARD MOYLE, of Marazion, Cornwall, from whom the following Account and Certificates had been received.

SIR,

I BEG the favour of you to lay the incloſed Papers before the Society for the Encouragement of Arts, Manufactures, and Commerce.—They contain a particular account of the drainage of a Marſh near this place, which for centuries has been overflown by the tides, and hitherto looked on as irreclaimable; and which land is abſolutely gained from the ſea.

The novelty of the mode of drainage, with the ſucceſs attending it, may probably attract the attention of thoſe intereſted in Marſh Lands near the ſea, in ſimilar circumſtances; and, from the proſpect of ſucceſs in its cultivation, a ſpirit of enterpriſe may

may be excited in this country to make ſimilar attempts.

Certificates of the ancient and preſent improved ſtate of the Marſh, with a plan* of the incloſure, exhibiting the drains, fields, their meaſurement, &c. are annexed. From my experiments on marſh or peaty land, I have ſubjoined an account of the beſt method of cultivating the ſame, with the attendant expences; and alſo an account of the various uſes to which peat, as an article of fuel, may be moſt advantageouſly applied; and which were never known to have exiſted in this Marſh before it was drained.

As my deſign of communicating the incloſed, ariſes from an ardent wiſh of promoting the laudable views of Agriculture, I hope the Society will excuſe this irregular Treatiſe, which the want of time prevents me from arranging more methodically. Should the Society approve of my attempts to introduce the recovery and improvement

* The plan here mentioned is reſerved for the inſpection of the public.

provement of ſuch lands, which are greatly neglected in this county, I ſhall think myſelf highly honoured by any mark of approbation which they may think proper to confer on,

SIR,

Your moſt obedient humble Servant,

RICHARD MOYLE,

Marazion,
October, 1795.

Mr. MORE.

An Account of the Drainage of a Marſh near Marazion, in Cornwall, formerly overflown by the Sea, and looked on as irreclaimable, but now in a ſtate of cultivation.

ON purchaſing the leaſehold of an eſtate near Marazion, in Cornwall, conſiſting of about two hundred acres, I found ſeventy in a ſtate of good cultivation, and one hundred and thirty acres of waſte land, conſiſting of marſh, croft, and ſandy ſoils. I flattered myſelf, that a great part of this unprofitable

unprofitable ſpot might be converted into uſeful and valuable land, which, in this neighbourhood, in the common ſtate of cultivation, is worth from three to ſix pounds the Corniſh acre (about one-fifth part larger than ſtatute meaſure). From a proſpect of recovering that part called the Marſh, which had hitherto been accounted irreclaimable, I laid down a plan of draining the ſame, which, if I ſucceeded in, might probably induce the proprietors of other tracts of Marſh-land in this vicinity, to make ſimilar attempts.

The novelty of my draining ſcheme, with its attendant difficulties, joined to the great diſlike which moſt farmers in the Weſt of England have to the improvement of Low Lands, drew on me the cenſure of the public, who treated the ſcheme as chimerical, and impoſſible to be effected, for the following reaſons:

Firſt—Becauſe the ſea had acceſs to this land, and overflowed it at ſpring-tides with two feet water;

Secondly,

Secondly—If the ſea were excluded, the freſh water would be accumulated, and ſtill keep it in the ſtate of a bog, as the water had no other vent than by its direct communication with the ſea; and,

Thirdly—That if the ſucceſs in the drainage ſhould be equal to my moſt ſanguine expectations, yet the nature of Marſh land, in general, would not admit of any valuable improvement.

However cogent theſe reaſons might appear to the public, I was convinced that they aroſe more from the want of a ſpirit of enterpriſe, and little knowledge of the nature of ſuch ſoils, than from a decided conviction of the failure of the plan; and, on conſidering the advantages likely to reſult from the improvement, in caſe of ſucceſs, and the example given to my countrymen, who poſſeſs ſimilar tracts of Marſh-land, I was emboldened to undertake the drainage of this bog, which for time immemorial had been looked on as utterly irreclaimable.

The

The ſpot fixed on for the intended improvement, conſiſted of ſixty-three acres, ſtatute meaſure; of which thirty-ſix acres were Marſh, ſeventeen acres of a light blackiſh ſand, and ten acres of croft, conſiſting of a light black mould, with a ſubſtratum near the ſurface, of a fine tenacious clay. The croft and ſandy land lay on a riſing ground, ſerving as a ſurrounding ſkirting to the Marſh, and which, from their gentle elevations, might be uſeful in rainy ſeaſons for cattle to reſort to.

On conſidering that the moſt fertile ſoils conſiſt of a combination of clay, ſand, and vegetable matter, in different proportions, and that theſe three ſubſtances were almoſt diſtinct, and to be procured in any quantity from this improvable ſpot, it appeared probable that, after a complete drainage was performed, little more remained to be effected, than a happy combination of theſe three ſoils, ſo contiguous to each other, to render the whole good and productive land.

The

The Marſh, containing thirty-ſix acres, is ſituated between the croft and the ſandy ſoil, which has been thrown up by the ſea, and ſerves as a natural embankment againſt the water, which at every ſpring-tide overflowed this Low-land to the height of two or three feet, by a direct communication of a river which carries off a part of the redundant water collected on its ſurface, from its own ſprings and others in its vicinity, and the rain from the higher grounds.

This Marſh, for time immemorial, has produced nothing but ruſhes, flags, goſs *(arundo phragmitis)*, *iris paluſtris*, water-lily, and ſeveral other aquatic plants, which, from their verdure, ſerved only as a decoy for cattle, that were frequently ſmothered in attempting to reach them, to the great loſs and injury of the tenants. Several perſons alſo have loſt their lives by getting at night into this moraſs, over which boats have frequently paſſed to enable ſportſmen to ſecure the game, which flocked to this place in great quantities during winter. From the production of *Marſh miaſmata*, fevers of the low

low nervous kind, but particularly agues, have greatly prevailed, to the annoyance and diſtreſs of the neighbourhood.

The great and inſuperable difficulty, which hitherto prevented even an attempt towards the draining this bog, aroſe from its being under the level of the ſea at ſpring-tides; ſo that no deeper outlet could be procured than the river, which ſupplied it with ſalt-water. But, on conſidering the nature of water, which preſſes equally on every ſide, I ſuſpected that a pipe, with a valve at its extremity, introduced at half-ebb, through the ſandy embankment, to the body of the Marſh, would tend to carry off the ſurface-water; and, from the ſhutting of the valve, on the approach of the tide, no ſea-water could gain admittance through the tube. On taking an accurate ſurvey of the levels from the ſea, at the point of half-ebb, to the ſurface of the ground in the Marſh, meaſuring in length one hundred and ſeventy-four yards, it was found that ſix feet of level could be gained, after allowing two feet for the flowing of the

water

water through the pipe; accordingly, an embankment of one thouſand one hundred and ſeventy-five yards in length, formed of ſtrong clay turf, about five feet high and ſix feet thick, was made round the two ſides of the Marſh, which were liable to be overflown by the ſea; the ditch ſerving as a channel to carry off the water, which uſed to flow over its ſurface. In order to carry off the water ſtill remaining on the Marſh, I procured one hundred and ſeventy-four yards of ſquare pipe, nine inches diameter and two inches thick, made of ſound fir-wood called balk, which, in the mines of this county, is the wood moſt commonly made uſe of, and found to be very durable, eſpecially if kept conſtantly in water.

In May, 1793, the firſt pipe was laid down on the ſhore, at the point of half ebb, and ſecured by means of a large rock, to prevent it from ſwimming; the other pipes were ſucceſſively joined, and laid nearly on a plane with the firſt, by throwing open the ſand. As we advanced to the higheſt part of the ſandy embankment, which was twenty-four feet

feet above the pipes, the difficulties were conſiderably increaſed, by the great quantity of ſand neceſſary to be removed, and its tendency to fall on the workmen; ſo that the approach towards the Marſh became tedious, and very expenſive. However, by purſuing every cautious plan which could be deviſed, to prevent accidents, and to make the work ſecure, we arrived, in five weeks time, at the borders of the Marſh, paſſing under the river and the new-made embankment at the depth of ſix feet under the ſurface, where the pipe opened into a reſervoir of eighteen feet ſquare and eight feet deep, prepared to collect the ſurface-water, which immediately flowed through the pipe with great rapidity, and diſcharged itſelf into the ſea, till the whole of the ſtagnant water was taken off. The aperture of the ſea-pipe had iron-bars placed before it, to prevent the inſinuation of extraneous bodies, and alſo a valve made of ſtrong wood, lined and hung with leather, and loaded with iron, to prevent it from ſwimming at the approach of the tide,

which always ſhut it ſo cloſe as to effectually exclude the ſea-water: the pipe within the reſervoir had alſo a ſimilar valve, for the ſame purpoſe, near its extremity, which was covered with an iron grating, to prevent the intruſion of roots, weeds, &c. that might probably obſtruct the paſſage of the water.

As ſoon as the tide returns to the pipe, which is uncovered ſix hours in twelve, the Marſh Water ceaſes to flow; and, during that time, collects within the reſervoir and trenches till the ſea begins again to retire; and when the collected water becomes of equal weight with the ſea water over the ſhore pipe, it ſinks gradually till the pipe is left by the ſea, when it regularly diſcharges the water ſtrained from the Marſh Land; and which amounts in winter to about 129,600 gallons, or 2160 hogſheads in twenty-four hours; but, in ſummer, the quantity is trifling, and does not exceed 43,200 gallons or 720 hogſheads. Some little difficulty at firſt aroſe from the valve not ſhutting itſelf properly, by the intruſion of pebbles; but this

was

was eaſily removed, by adding about two feet of pipe beyond the valve.

Trenches or open drains of three feet deep, five feet wide at the top, and three at the bottom, were immediately carried from the reſervoir, which was the loweſt place, to the extreme parts of the Marſh, on the ſandy ſide, about ſix feet within the new embankment, and interſected by others at right angles towards the croft, from fifty to ſeventy-two yards diſtance, according to the nature of the ground, dividing the whole into regular oblong fields, as in the plan; the wetneſs of the ſoil, and the great difficulty of procuring a firm footing for the workmen, obliged them to ſtand on pieces of timber, to complete thoſe numerous drains, which every day grew firmer; and in a few weeks the ſoil became ſo conſolidated, as to admit of perſons walking over it with tolerable ſafety. In making theſe drains a pot of copper coins, containing about one thouſand, was diſcovered at the depth of three feet from the ſurface, which, on examination, appeared to belong to the Emperor Victorinus, who reigned in the third century;

theſe coins were much injured by the corroſion of the marine acid, but ſeveral were ſtill perfect enough to trace the outlines of the Emperor.

As ſoon as the evaporation aſſiſted the conſolidation of the ſurface, the air, within a mile of the Marſh, became ſo ſtrongly impregnated with a ſulphureous ſmell, as to render the place quite obnoxious to paſſengers, till the ground was perfectly dry: this might probably happen from the evaporation of the fluid parts, producing a decompoſition in the mud, forming therein a *hepar ſulphuris*; or hepatic air may be eaſily produced, by adding ſea water to dung, or vegetable ſubſtances, from the vitriolic ſalts contained in the water, and which probably was the caſe in this ſoil. In the courſe of a few months the ſurface of the Marſh was depreſſed from twelve to eighteen inches; ſo that the bed of the river became higher than the ſurface of the land.

In making the drains, it was diſcovered, that the upper ſtratum, of two feet and a half, conſiſted of a dark-coloured mud, formed

from

from the ſediment of ſtagnant water and a peaty ſubſtance, bound firmly together by an infinite number of the goſs and ruſh roots; the ſubſtratum, an entire body of peat three feet and an half deep, of which twenty-one inches are of a very black colour, and the loweſt part of a light browniſh or deep yellow; under the peat lies a ſtratum of ſand about five feet deep, which carries evident marks of its being the bed of the ſea, of a very ancient date, and which has been gradually excluded by means of the accumulation of muddy ſediments, and the dropping of the leaves, &c. of aquatic plants; and which together form peat moſs. The horizontal poſition of the leaves and ſtems, which are eaſily diſcovered in the peat, is a ſtrong preſumption of thoſe bodies having fallen down, and being buried by the conſtant accumulation of mud, which with the leaves are the component parts of peat, though by ſome it has been ſaid to be a vegetable production, *ſui generis*. The total excluſion of air is abſolutely neceſſary before theſe bodies will aſſume the real appearance

or properties of peat moſs; and it is probable, that the upper ſtratum, which at this time partakes of very little of real peat, would at a future period, by the gradual addition of ſimilar bodies and the excluſion of air, poſſeſs the ſame qualities and properties as the under ſtratum, and by this gradual accumulation totally exclude the ſea. But the coins found in the Marſh indicate that the production of peat moſs has been very ſlow in this particular ſpot.

The ſtratum of ſand under the peat does not appear to be the original bed of the ſea; for on ſtreaming or ſearching for tin, from ſix to ten feet deeper, another ſtratum was diſcovered, conſiſting of round ſmooth pebbles and gravelly ſubſtances containing tin; among which are bodies of trees, and a large number of hazel-nuts in the moſt perfect ſtate, and which muſt have been collected in this place by means of ſome extraordinary inundation, that ſwept thoſe beds away from the higher lands.

In conſequence of the diſcovery of peat in this Marſh, a large quantity has been cut up,

up, dried, and made uſe of as an article of fuel, for a variety of purpoſes, to which it is admirably adapted, and ſold at a much cheaper rate than coals, and boils water in much leſs time; it is applied in public breweries, and for every culinary purpoſe as an article of fuel; it is made uſe of to great advantage in grates, hearths, or ovens, and, when coaked, will ſerve for the niceſt operation in chemiſtry, and in that ſtate is ſufficiently ſtrong to ſmelt metals of the moſt difficult fuſion: experiments are now making on it to calcine lime, which is intended as manure for this land. This peat produces a ſmall quantity of red aſhes, which, on lixiviation, are found to contain a large proportion of ſea ſalt, which, for land not already impregnated with the marine acid, will prove a valuable manure.

After the drains were finiſhed, all further operations on this land were diſcontinued till the ſpring of 1794, when the ſurface of a great many acres, conſiſting of light ſedgy ſubſtances, was pared and burned during the ſummer, and the aſhes ſpread over the land;

afterwards the plough was introduced, to deſtroy the amazing growth of the *arundo phragmitis*, which, from the infinite number of its ſtrong ſpreading roots, bound the ſurface ſo firmly together, as to require a numerous team of cattle to plough it a proper depth, and which, from their frequent treading over the ſame ground, rendered the ſoft parts impaſſable; but this difficulty was overcome by ploughing the firſt time without a mould board, ſo that fewer oxen were able to perform the ſame work. The ſoil, on being turned up, yielded a moſt offenſive ſmell, though not of the ſulphur kind. The land was frequently ploughed and harrowed, even to ſix or ſeven times, the inflammable ſubſtances ſet on fire, and the aſhes ſpread on the ſurface. After all theſe operations, which were alſo repeated in 1795, the ground became conſiderably depreſſed and ſo conſolidated as to admit of carts with narrow wheels, loaded with a ton of clay, to paſs over it with great eaſe. On the ſides of the drains, large quantities of yellow ſea ſalt may be collected, and which were

produced

produced by the evaporation of its fluid parts.

In the ſpring of 1794, four acres of oſiers were planted, after the ground had been thrown up into ridges; but the large quantity of ſea-ſalt deſtroyed the whole, except a few which grew on the higher ground in great luxuriancy. The oſiers at firſt put forth fine ſhoots; but as ſoon as their tender roots abſorbed the ſaline particles in the ſoil, they died immediately. Potatoes were alſo planted in large quantities the ſame ſeaſon; but moſt of them, particularly in the low places, where they never vegetated, ſhared the ſame fate.

On enquiry I find that thoſe farmers who lay large quantities on their piles (heaps) of manure, experience the ſame loſs on theſe ſpots for two or three years afterwards; and then the ground aſſumes the richeſt ſtate of vegetation. In the ſpring of 1795, after the ſurface was covered with large quantities of clay, ſeveral acres were ſown with oats, ſome of which produced very good crops, particularly in thoſe places where the ma-

rine

rine acid was diminiſhed. Turneps and potatoes alſo grew well.

At preſent, the *poa trivialis* grows naturally in the greateſt luxuriancy on every part where the ſaline particles are not in too large a quantity: the appearance of this graſs is a ſure indication of the ſoil having parted with a large proportion of the ſalt. Several ſorts of cultivated graſſes have been tried in ſmall quantities, as rye-graſs, trefoil, clover, and meadow fox-tail (*alopecurus pratenſis*), which thrive with great luxuriancy; chicory (*cycorium intybus*) has been ſown, and grows, but does not thrive well, moſt probably from the ſalt.

It is ſurpriſing to ſee the effects of frequent ploughing, &c. on this kind of ſoil, which, though at firſt only a congeries of roots and light ſubſtances, has, in a year or two, by ſuch practice, aſſumed an earthlike appearance; and, with the addition of clay, lime, ſmall quantities of manure, particularly of animal oil, and frequent heavy rolling, is likely to become, from the moſt uſeleſs ſpot, the moſt productive land for paſture, to

which only it ſhould be applied.—In order to conſolidate the ſoil more perfectly, ſo that the earthy particles may embrace the roots of the graſſes, and retain their proper moiſture, on which the luxuriancy of ſuch ſoils in a great meaſure depends, the ſurface is to be frequently compreſſed, by means of a rolling-cart, which may be burdened according to the ſtate of the land, and is a moſt uſeful machine to carry manure on low-lands during wet ſeaſons.

This machine conſiſts of three circular pieces of ſtrong elm, two feet diameter, and each eighteen inches long, through which a ſtrong iron axis is paſſed, ſo as to protrude a few inches on each end beyond the rollers; after all, allowing an inch between each piece, for the conveniency of turning round. On the projecting part of the axis, a fixed frame-work is placed to ſupport the cart, which may be loaded to any degree, and employed ſimply as a roller, or to carry manure, &c. on land where common wheels cannot be admitted.

Every

Every Meadow in this improved ſpot can be watered with much eaſe, by means of the river cloſe to the embankment, and which will be employed for that purpoſe, when paſture is introduced throughout the whole.

Marſh Lands in general will admit of the greateſt improvement, by the following mode of treatment:

Firſt—By a mechanical arrangement and change of its different parts, as by frequent ploughing, harrowing, and burning.

Secondly—By the addition of heavy ſubſtances, as marle, clay, gravel, &c.

Thirdly—By ſuch ſubſtances as act chemically, and bring the inert vegetable matter into action, as lime, chalk, alkaline ſalts, &c.

Fourthly—By manures, particularly thoſe which contain a large quantity of animal oil or mucilage, as putrid fiſh, ſea-wrack, ſtable-dung, &c.; for Marſh Land in general ſeldom contains any animal ſubſtance, which, in great

great measure, is the grand constituent part of a rich soil.

Fifthly—By compression, with rolling-carts, cattle, &c.

Sixthly—By watering.

The Sandy and Croft Soils adjoining to the Marsh have been cultivated, and produced this summer very excellent crops of Potatoes, Turneps, Barley, Oats, Buck-wheat, and Tares.

RICHARD MOYLE.

October 16, 1795.

An Account of the Expences of draining and recovering thirty-six Acres of Marsh Land from the Sea, belonging to Richard Moyle, *of Marazion in Cornwall, performed in* 1793.

	£.	s.	d.
To timber for the pipes, 174 yards in length, 9 inches diameter within —	18	10	0
Carriage of ditto — —	0	15	0
Carpenters, for sawing balk, and making pipes with valves, nails, &c. —	10	9	2
Smith for iron bolts to secure the pipes to the rocks, gratings, &c. —	2	10	0
Carried forward	32	4	2

To

	£.	s.	d.
Brought forward	32	4	2
To labourers for throwing open the ſand, from 1 to 24 feet deep, and fixing 174 yards of pipe, from the 11th of May to the 15th of June, 1793 —	44	2	4
2,412 yards of open drains, 3 feet deep, 5 feet wide at the ſurface, and 2½ feet at the bottom, at 2½d. per yard —	25	2	6
Repairing and clearing the ſame —	6	18	3
765 yards of croft trench, at 5d. per yard	15	19	7
1175 yards of embankment, to keep off the ſea, 5 feet high and 6 feet thick, at 6d. per yard — —	29	7	6
Repairing the ſame at different times	8	13	1
Flood-gates to keep back the ſea at ſpring-tides, iron-work, &c. —	2	2	0
Total expence of draining 36 acres of Marſh Land, and keeping it dry	164	9	5
Or, per acre — —	4	11	4½

An Account of the average Expence of cultivating and improving a Statute Acre of Marſh or Peat Land.

	£.	s.	d.
To paring the ſurface — —	1	17	4
Drying, gathering, and burning the turfs	0	10	0
Spreading aſhes — —	0	2	0
Six ploughings, at 10s. — —	3	0	0
Carried forward	5	9	4

To

	£.	s.	d.
Brought forward	5	9	4
Five harrowings with rolling, at 5s.	1	5	0
Horſe-raking and burning roots, &c. three times, at 2s. 6d. — —	0	7	6
Spreading aſhes three times, at 1s. —	0	3	0
200 tons of clay, paid for raiſing, at 1½d.	1	5	0
Filling and carting the ſame, at 3½d.	2	18	4
Spreading ditto — —	0	3	0
40 buſhels of lime (mixed with 240 buſhels of peat), at 9d. —	1	10	0
Carting and ſpreading the ſame —	0	3	0
40 cart-loads of dung, at 1s. 6d. —	3	0	0
Carting and ſpreading the ſame —	0	12	0
Earthing up ridges with a double-mould board plough, to keep it dry during winter — — —	0	2	6
Graſs ſeeds of different ſorts, with harrowing and rolling — —	0	12	0
Expence of cultivating per acre	17	10	8
Expence of draining per acre	4	11	4½
Total expence of improvement per acre	22	2	0½

Thirty-ſix acres, at £22 : 6s. 2½d. per acre, is £795 : 13s. 6d. —the amount of all the Expences to make the Marſh Paſture Land.

WE certify, that the ſpot of land near Marazion, in the county of Cornwall, called the Marſh or Bog, which was drained, in 1793, by Mr. Richard Moyle, of

of the ſaid place, has been covered, from time immemorial, with ſeveral feet of water, collected from ſprings and ſtreams from the higher lands, and from the regular overflowing of the ſea at ſpring tides. The inhabitants of the villages around this ſtagnant water were formerly viſited with agues every year, which now are ſeldom heard of. We have paſſed over this Marſh in a boat, during winter, in queſt of game, as footing in moſt parts of it was unſafe. This land was formerly of no value, but rather an injury to the tenant, from the frequent loſs of his cattle, which at times have been ſmothered in it, and its ſpontaneous produce only ruſhes and goſs. No attempt was ever before made to remove the ſurface water, from the apparent impoſſibility of draining land under the level of the ſea; but it is with much ſatisfaction that we can certify, of this Marſh being now moſt completely drained, by means of a ſquare wooden pipe, nine inches diameter, and one hundred and ſeventy-four yards long, paſſing from a reſervoir in the Marſh ſix feet under

its ſurface, through a high embankment of ſand, in ſome places twenty-four feet deep, to that part of the ſhore where the tide approaches at half-ebb, and which, at ſpring-tides, is covered with above ten feet of water.

The ſea is prevented from getting into the ſaid pipe by means of a valve at its end, which ſhuts at the approach of the tide, and again opens at its return, ſo as to permit the water, collected in the reſervoir during that time, to paſs off with eaſe. The whole Marſh is ſurrounded with a ſtrong embankment, to keep out the ſea and the freſh-water. The land is divided into regular fields, by means of drains or trenches, as expreſſed in the plan ſent, ſufficient for the uſe and occupation of a tenant. Several acres of the land have been frequently ploughed, harrowed, and burned; and, being now completely pulveriſed, aſſumes the appearance of ſoil. Large quantities of clay have been carried and laid on its ſurface, by means of carts, which paſs over

it with as much eaſe as on the firmeſt lay ground. Crops of Oats, Potatoes, and Turneps, have ſucceeded very well this ſeaſon, except on ſome of its loweſt parts, where the ſaline particles depoſited by the ſea, are ſtill in too large a quantity for vegetation to take place. Graſs ſeems to thrive with great luxuriancy; and the whole promiſes to become, in a few years, from the great labour and expence of manure, clay, lime, &c. beſtowed on it by Mr. Moyle, a valuable ſpot of paſture-land. The croft and ſandy ſoil adjoining to the Marſh, which were never before cultivated, have produced good crops of Barley, Oats, Potatoes, Turneps, Buckwheat, and Tares.

This ſingular mode of drainage ſeems to be quite new, as far as we know, or ever heard of, and which was never ſuggeſted for this purpoſe, till put in execution by Mr. Moyle; and which is the only plan that could poſſibly drain this ſpot of land ſo much under the level of ſpring-tides, and which may be applied with great advantage

to

to Low-lands, ſituated in ſimilar circumſtances, ſo as to recover them from the ſea.

RICHARD JOHN, Ludgvan, near Marazion.

JOHN JAMES, Marazion.

October 16, 1795.

WE, the underſigned, do hereby certify, that the eaſtern part of a tract of land, called the Marſh, lying between the towns of Penzance and Marazion, and ſituated near the ſea, ſo as uſually to be overflown at ſpring-tides, was completely drained during the ſummer of 1793, by Mr. Richard Moyle, of Marazion.

The drainage was effected by the introduction of a ſtrong wooden tube, at the level of half-ebb, through a bank of ſand and gravel, which defends the Marſh from the immediate action of the ſea, for a great part of its length. Reſervoirs are conſtructed for containing the water, when the ſea riſes above the tube; and a valve, at the further extremity, effectually prevents the entrance

of any ſalt-water. The tube enters the Marſh at about ſix feet under its ſurface, from whence drains are conducted to the different parts, forming, with the embankment againſt the river and ſea, a work of conſiderable labour and expence. In its former ſtate, the land was of very little value, producing ſcarcely any graſſes, but abounding in ruſhes, reeds, &c. It is now perfectly drained; a large part of the ſurface has been pared and burnt; ſeveral acres have been completely pulveriſed, by repeated ploughings, rollings, and harrowings; and large quantities of clay have been added to the ſoil. The chief obſtacle to its immediately becoming good land, ſeems to conſiſt in the too large portion of ſea-ſalt remaining in the ground, ſince the more elevated ſpots have already afforded favourable ſpecimens of Corn and Potatoes, whilſt the drains, conveying freſh water, abound with vigorous graſſes, principally Poas. It is propoſed to get rid of part of the ſalt by flooding, and to counteract the remainder by animal and vegetable recrements and lime; this

this laſt will be calcined by peat, found in great abundance in ſome parts of the newly-drained land, and which promiſes, as an article of fuel, very materially to benefit the neighbourhood.

DAVIES GIDDY, F. R. S.
of St. Erth, Marazion.

HENRY WILLYAMS, Clerk,
St. Erth, Marazion.

October 14, 1795.

THIS is to certify, that I meaſured a piece of land in the pariſh of Ludgvan, near this place, called the Marſh, which was formerly covered with water, but now completely drained by Mr. Richard Moyle, and become ſo firm as to admit of heavy-loaded carts paſſing over it with great eaſe. The whole is divided, as in the plan, into regular fields, by means of open drains, fit for the uſe and occupation of a tenant, and ſurrounded, on the ſea-ſide, with a ſtrong embankment of turf, about five feet high and ſix feet wide; and, on the land-ſide, with a large open drain to

carry off the water from the higher lands, ſo as to render the eſtate completely ſecure from inundation.

The meaſurement of the adjoining high lands, conſiſting of croft and ſandy ſoil, which were never before cultivated, is alſo annexed.

	Acres.	Roods.	Poles.
The Marſh contains — —	35	3	35
The Croft — — —	10	1	20
The Sandy Soil — — —	17	0	0
	63	1	15

	Yards.
The Embankment —	1175
The Drains — —	2412
The Croft-drain —	765
The Draining-pipe —	174

JOHN COCK,
School-maſter, Marazion.

October 12, 1795.

Several

Several Claims for the Premium offered for DRAINING LAND, being the GOLD MEDAL or THIRTY GUINEAS, were this Seſſion received by the Society; and the Premium adjudged to Mr. JOHN CROCKITT, of Woodford-Grange, near Wolverhampton, who made choice of the Pecuniary Reward. His original Papers, with a Sketch of the Drains, are reſerved in the Society's Collection.

SIR,

I SHALL be obliged to you to lay before the Society for the Encouragement of Arts, Manufactures, and Commerce, the following particulars on a ſubject, which I believe comes under their plan of general improvement.

Being in poſſeſſion of a valley containing thirty-ſix acres, conſiſting of wet peat intermixed with quickſands, the underſtratum gravel, varying in its depth from three to eight

feet, I determined to try ſome experiments towards improving it. I proceeded to obtain a fall by a main drain, three quarters of a mile below the land I intended to improve. In carrying up the valley the maſter drains, I found it neceſſary frequently to leave the work for a week or longer, to carry off the top-water; and then take off ten or twelve inches at a time only. Two years attention enabled me to complete them, by deepening at ſeveral times to the average of ſix feet, with a proportionable fall. I then proceeded to ſtrip the remainder of the ſurface of its incumbrances, conſiſting of ſome very ordinary alders, and an immenſe quantity of what is here called haſſocks, being tufts of cloſe-matted roots of the ſedge kind, riſing to the height of four or five feet above the ſurface, with blades of rough graſs hanging to the ground each way. The whole valley is bounded by a water-courſe (which I have deepened) on the one ſide, and a cut to obtain a head for the uſe of an iron-work on the other. Here I

muſt obſerve, we had two leakages to encounter, this cut being raiſed from four to ſix yards perpendicular above the land improved; the natural conſequence of a valley parallel, with a bank of light gravel and ſand. Our greateſt breadth is not more than one hundred and forty yards, and in general nearly level.

I proceeded to cut my carriers and catch-drains four feet deep, forming oblong ſquares, eight by fourteen or ſixteen yards, frequently nearer; ſometimes bottoming the peat, at others not; and often found it neceſſary to leave them open for two or three months, and join the communication at every angle. The materials uſed are ſome alder rods, to prevent the bottom of the drains from ſinking, which often happens where it is not expected, and is my reaſon for giving it every draught in my power: two parallel rows of ſtones, a ſecond row upon them, then a third; making a body of from fifteen to eighteen inches deep at leaſt, excluſive of the covering,

which

which is formed ſubſtantially by the haſſocks quartered. After ſtripping them of their ſedges, ſo as to fit cloſe, I level the ſurface, dreſs it with lime and other compoſt, and ſeed it.

As we have water ſufficient to flood the whole, I had in view the advantage the farm would receive from the great quantity of manure annually procured for it, by the improvement, that is, the produce of the valley conſumed upon it, and no return required. I have done this year two thouſand one hundred and twenty-five yards upon four acres and an half, excluſive of the maſter drains: the quantity of water emitted is twenty hogſheads per minute. Eſtimating this by that done two years ago, I conceive its future value twenty-five or thirty ſhillings an acre per annum: its former, as valued by Mr. Biſhton, of Kilſal, four years ago, was two ſhillings and ſixpence.

Such, Sir, were, for ages, the ſituation of Woodford Moors, without being of ſervice,

often

often detrimental, if cattle, allured by the verdure of the creſs-beds, ventured to go upon them, as we had them to draw out again, injured or ſmothered. If my labour is not beneath the notice of the Society, I humbly beg leave to offer myſelf a candidate for the premium offered for ſuch improvement. If I have not literally complied with the terms directed, it was becauſe I conceived the laying ſo large a number of drains far more likely, by aſſiſting each other, to be laſting, than any other method I have yet heard of, where fewer communications were made; and I believe I have made twenty-five acres of land more than ten times its original value.

I remain, SIR,

Your obedient humble ſervant,

JOHN CROCKITT.

Woodford Grange,
near Wolverhampton,
December 30, 1795.

Mr. MORE.

Average

Average Expence per Acre, exclusive of the Master-Drains.

	£.	s.	d.
450 yards of Covered-Drains, at 1½d.	2	16	3
35 loads of Stone, Carriage, &c.	3	10	0
Grubbing-up the Hassocks, preparing, &c.	0	12	0
Levelling the Surface	0	15	0
Nine quarters of Lime, Carriage, and Spreading	2	2	0
	£.9	15	3

WE are acquainted with the land above-mentioned: before the improvement, it was a morass, wet, springy, and impassable; and it is now dry. We believe the fore-mentioned statement to be true; and that the land is rendered above ten times its former value.

J. Bevan, Minister of Tryfull.

Thomas Barnesley, Churchwarden, Jos. Higgs, Overseer of the Poor, } of Tryfull.

SIR,

SIR,

IN conſequence of a requeſt from Mr. John Crockitt, who occupies a farm belonging to me, ſituated at Woodford Grange, in this county, I have examined the part of it called Woodford Bogs, and find that which has been laſt year improved, ſufficiently drained to bear any ſort of cattle. I had previouſly examined the ſtatement ſent to the Society, and have every reaſon to believe it to be perfectly correct, and the Certificates to be ſigned by proper and reſpectable perſons reſiding in the neighbourhood. The expence incurred to procure a fall, and the difficulty ariſing in the execution, will, I hope, render Mr. Crockitt worthy of the attention of the Society; and the more ſo, as he intends purſuing his improvements, on a ſituation hitherto unfit for all agricultural purpoſes. I am, SIR,

Your obliged humble ſervant,

JOHN WROTTESLEY.

Wrotteſley,
near Wolverhampton,
March 2, 1796.

Mr. MORE. The

The Thanks of the Society were this Seſſion given to Mr. JOHN MIDDLETON, of Paradiſe-Row, Lambeth, for the following Paper on MAKING HAY, with Drawings annexed thereto, as ſhewn in the Plate annexed.

HAVING obſerved in the courſe of my reading, that ſomewhere in the North of England, it is not altogether uncommon to ſee ſome of the inhabitants dragging their hay together, without the aſſiſtance of either cart, waggon, or ſledge; and having myſelf experienced that much time, and, in general, the beſt workmen, are employed in loading the carts in a hay field, particularly at a time when the price of labour is high, and hands not always to be procured; I was induced, from theſe conſiderations, to turn my thoughts to the ſubject; and, in conſequence, ſketched the lines for a carpenter to make me the following machine, for the above purpoſe; and it performed the work ſo well, that I uſed it all laſt hay-time with great advantage.

It

It is drawn by four horſes, in pairs, with a boy to manage and drive each pair. On ſmooth ground theſe alone were ſufficient; but, where the machine was to be drawn acroſs ridges and furrows, it was found neceſſary to have a man to attend with a fork in his hand, which he ſhould uſe, as often as the machine ſhews a tendency to ſlide over the ſtill row of Hay, by thruſting the prongs into it to the greateſt depth that can be done, without ſuffering the points to touch the ground, and nearly cloſe to the Hay then in motion by the machine: the moving-hay advances to the fork, and drives forward the hay ſo held by its prongs, and with it all that part of the row; and, it being once put in motion, the machine keeps it ſo. The man ſhould keep walking briſkly forwards before the machine, and put the fork into the ſtill-hay, until the machine gets hold of it, as often as may be neceſſary, which will be particularly ſo in paſſing every furrow; but in level fields this will ſeldom happen; though I found that, even where the ridges were a little unfavourable, as in the

the caſe of being too round, the machine was prevented from being ſtopped or impeded by breaking the row of Hay at every twenty or forty yards diſtance.

I ſhall endeavour to make the whole more clearly underſtood, by the following ſketches and explanations, to which I beg leave to refer you; and ſhall now proceed to obſerve on what I conceive to be its particular merits.

In caſes where the Hay can, without inconvenience, be ſtacked in the field, it will entirely ſuperſede the uſe of every ſort of carriage, as it may be made to draw all the Hay in the field to the ſtack; and it may, with equal facility, be made to draw the Hay produced on any number of fields to one place, provided the gateways are made ſufficiently wide to admit the machines paſſing through; namely, about fifteen feet: and conſequently all the Hay of any farm might thus be drawn to the ſtack-yard. But it appears to be adviſable, as a matter of prudence, to confine its uſe to a graſs ſurface, as in paſſing over gravel roads, gateways, &c.

&c. it would probably pick up ſome dirt, and other extraneous matter, which might be injurious to the Hay.

It will be found uſeful in very ſcorching hot weather, eſpecially when hands are ſcarce, in dragging the Hay together the moment it is ſufficiently made, and thereby preventing (what frequently happens) its being too much dried. In catching or ſhowery weather it will be of ſtill more ſervice, as in the caſe of a field of Hay, more or leſs, not being quite fit to carry to the ſtack, and ſymptoms of approaching rain appearing, the whole may generally be ſwept into heaps, containing as much as the horſes can drag at twice, by fetching the ends of each row to the middle, or, by drawing two or more rows into one heap, and employing every hand in making it into large cocks (or pikes), containing a ton or two in each (proportioning the ſize to the dryneſs of the Hay): thus the whole may frequently be ſecured before the rain falls; and, if properly made, they will turn all the rain that may fall. Even if the weather ſhould prove wet

for a week or more, theſe cocks will be found to have ſuſtained no very material damage, except that the outſides will be a little ſtained or diſcoloured by the rain, and the bottoms by damps ariſing from the ground; the latter will always happen when the cocks are ſuffered to ſtand a fortnight or more in the field, but the former will only happen in caſe of uncommonly heavy or long-continued rains.

In caſes where the Hay is ſufficiently made to bear ſtacking, and there is an appearance of rain, it may be ſpeedily dragged to one place near the middle of the field, and all hands employed in making the ſtack, which may immediately be ſecured by putting a cloth over the top; and even where a cloth is not at hand, only let it be made ſufficiently high in the middle, hard trod, and well raked down on the outſide, and it will be almoſt equally ſecure.

I experienced its uſe in all theſe caſes laſt ſummer, and am of opinion, that when the boys are agile, and the horſes tractable, and

uſed

uſed to the work, ten acres of Hay may be thus ſecured in little more than an hour.

I am, SIR,

Your very humble ſervant,

JOHN MIDDLETON.

Paradiſe-Row, Lambeth,
November 26, 1795.

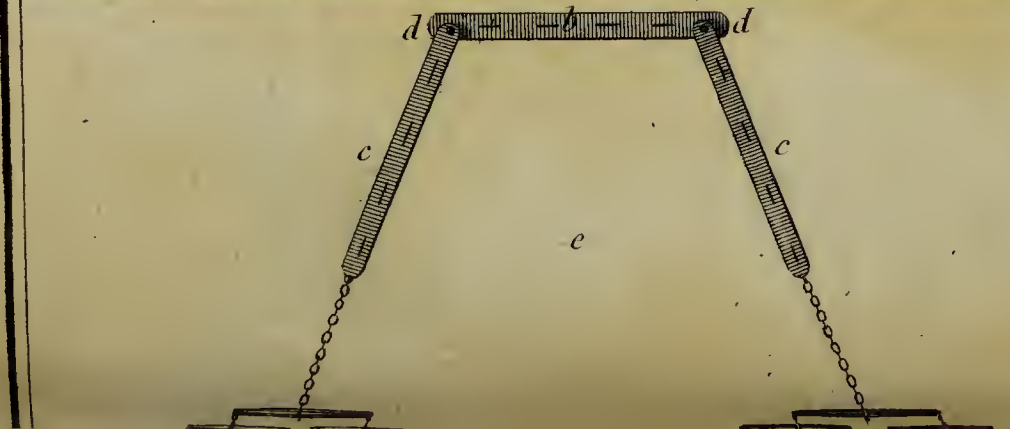
Mr. MORE.

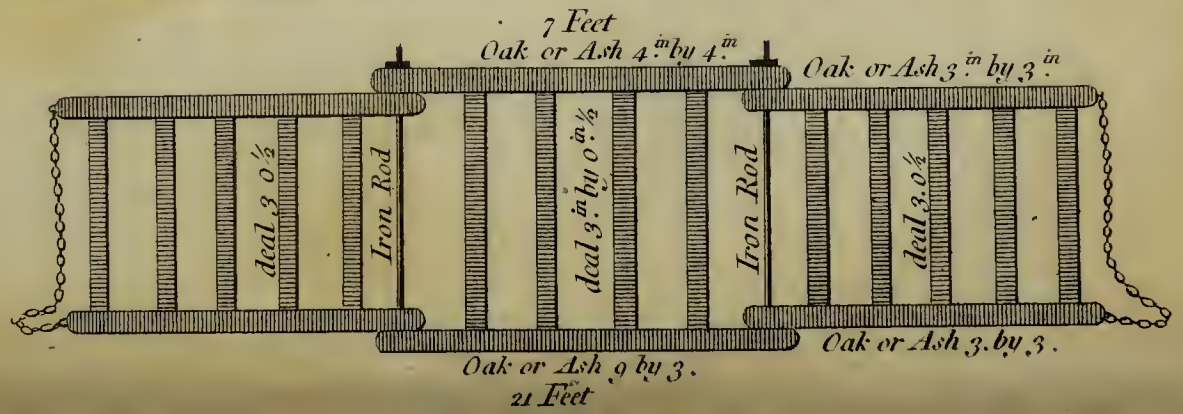
Explanation of the Machine and the manner of uſing it, as ſhewn in the Plate.

IT will firſt be neceſſary that the Hay ſhould be put into rows, as is univerſally done before the loading of carts, waggons, or ſledges; then, in order to ſweep the Hay together with greater facility, order a man with a fork to go and turn the end of a row up, two or three yards, ſo as to form a ſort of heap, and then walk on ten, twenty, or forty paces, and break the row, by turning the Hay forward into another ſimilar heap; and let him go on and repeat this operation to the

end of the row, which he ſhould do as faſt as he can walk ; then order the boy who has the management of that pair of horſes, to whom the empty machine is attached, to draw it acroſs the end of the row ; and, the moment the centre of the machine is at the middle of the row, let him turn his horſes ſhort round, to within a yard or two of the Hay, ſo as to be in a proper poſition to ſet off : the other boy muſt inſtantly place his horſes on the oppoſite ſide of the row, and hook the chain of his ſplinter-bar to the machine, pulling the gate or ſide of the machine round, ſo as it were to claſp the Hay as at *(a)*. The boys being mounted, and all now ready to ſtart, let them draw ſlowly on for the firſt twenty or forty yards ; they may then, if the buſineſs requires diſpatch, increaſe their pace, urging the horſes into their faſteſt walk, and from that into a ſlow trot, until as much Hay is collected as the horſes can draw : then, unhooking one end, let the horſes at the other, turn from the Hay, and draw out the machine from behind it : then trot away to the end of the next row, and repeat the proceſs, taking care

View of Mr. Middleton's Machine at Work.




7 Feet
Oak or Ash 4 in by 4 in
Oak or Ash 3 in by 3 in
deal 3 0 ½
Iron Rod
deal 3 in by 0 in ½
Iron Rod
deal 3 0 ½
Oak or Ash 3 by 3
Oak or Ash 9 by 3
21 Feet

care to keep the horſes on each ſide of the Hay, at equal diſtances from the row, and opoſite to each other. When the Machine is loaded, and the intention is to draw the load to a diſtant place, the four horſes cannot be kept too near together.

The Elevation of the Machine, as it appears when drawn by one end, and empty, is ſhewn in the lower part of the Plate, where the ſcantlings of the ſeveral parts of the Machine are marked.

The Plan of the Machine, when in the action of drawing the hay, is alſo ſhewn in the lower part of the Plate, and lettered as follows.

a. a. a. a. The places occupied by the horſes, when drawing (though in many caſes one horſe on each ſide would be ſufficient).

b. The back, or principal part of the Machine.

c. c. The ſides, or gates of the Machine, which ſwing on the iron rods fixed in the back at *d. d.*

e. The row of Hay.

A Bounty of FIFTEEN GUINEAS was this Seſſion adjudged to Mr. EDWARD KNIGHT, of Great Bardfield, Eſſex, for his NEW-CONSTRUCTED HARROW; a Plate of which is annexed, and a Model reſerved in the Society's Repoſitory.

FINDING, in the courſe of my buſineſs in huſbandry, many inconveniences attending the common mode of harrowing, and that it fatigued my horſes much more than the work of ploughing, any plan that ſhould occur to me for their relief, as well as for obviating every other difficulty, I flattered myſelf would be an object eſſentially ſerviceable. It muſt be a remark diſcernable to every perſon, who will pay the leaſt attention, that the common Harrow is almoſt a dead weight after the horſes; the irregular and uneven motions cauſe inceſſant checks, which the horſes muſt inevitably feel the unpleaſant effects of, both from their collars as well as the traces. I likewiſe frequently experienced ſome trouble by the

Harrows

Harrows being clogged up, in conſequence of too great a weight on the fore-teeth.

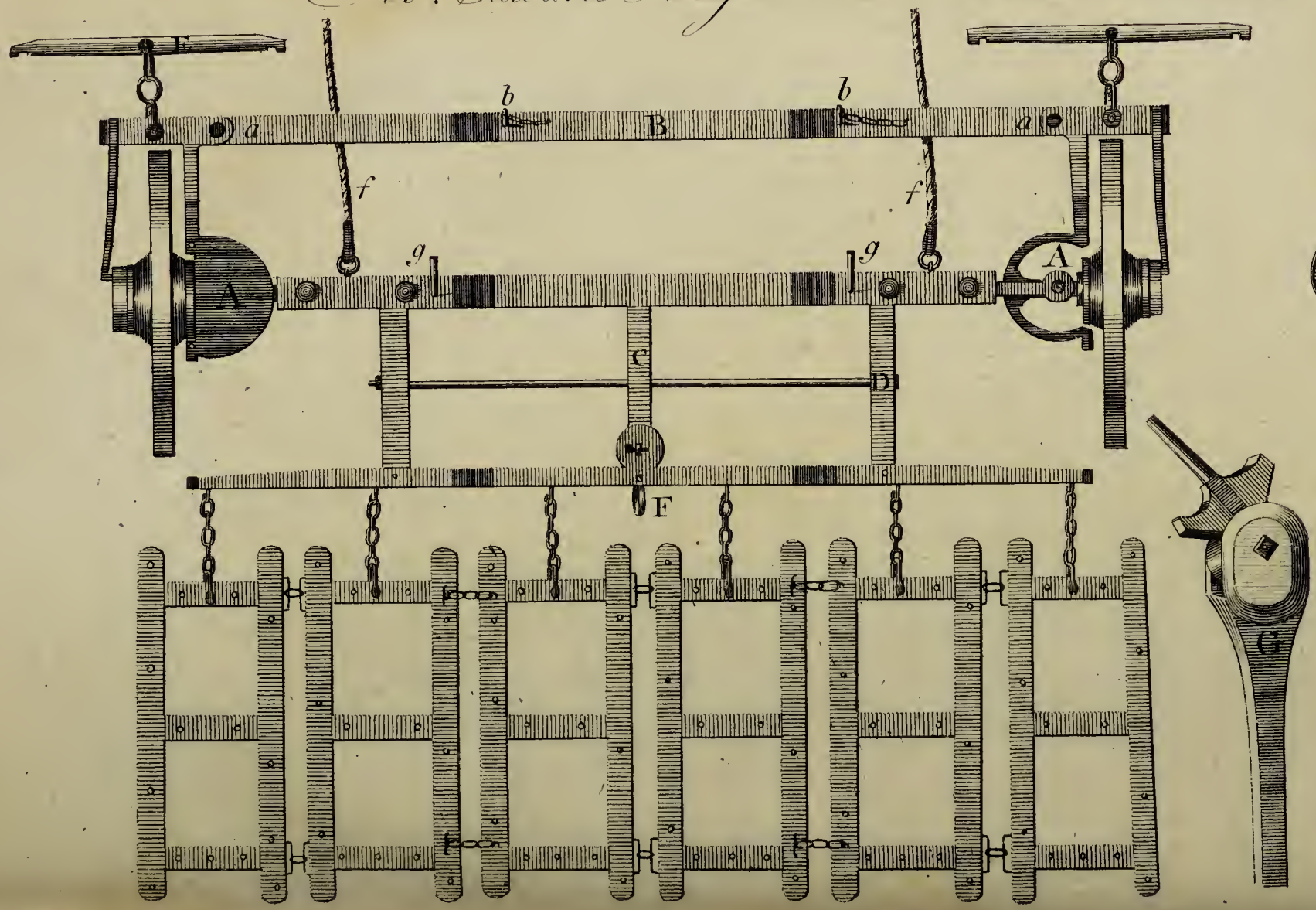
In order to remedy theſe, as well as many other inconveniences, I was induced to try a pair of wheels with the axle-tree entire, which I found anſwered the purpoſe with reſpect to the horſes, as the Harrows worked much eaſier; they prevented the too great ſtreſs on the fore part, which of courſe was not ſo liable to be choaked up, by collecting every impediment that might fall in the way; and the workman found little or no difficulty in keeping his Harrow clean, a circumſtance difficult to be done with the common Harrow. Though I was perfectly ſatisfied that this plan had a material effect, by being much eaſier to the horſes, as I have before obſerved, ſtill I met with great inconvenience from the axle-tree being entire; it required a conſiderable ſcope of ground at every turning. I likewiſe obſerved, that if either of the horſes was more forward than the other, or not perfectly ſteady in his drawing, the wheel left the furrow proportionably, and loſt its ſtrait

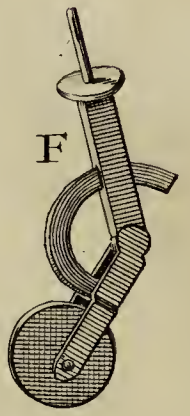
direction: another objection I made to the axle-tree being entire, was that it greatly incommoded me in paſſing through the gateways, when I wiſhed to convey my Harrows from one field to another.

In order to remove theſe difficulties, I have contrived two joints, A A, in the axle-tree, one of which, in the print, is covered, as when the Harrows are at work; the other uncovered, to ſhew the conſtruction of the joint; and two joints, *a a*, in the front of the bar; by means of which I find, by repeated trials, that the pliability of the tree, and likewiſe of the bar, humours the wheels and keeps them in their proper directions in the furrow, and, requiring very little ſcope of ground, the turnings are rendered very convenient and eaſy. The objection I ſtarted with reſpect to the removing the Harrows, as occaſion required, I find now perfectly done away.

If, in the courſe of working the land, a farmer varies in the breadth of his furrows, I have contrived, in order to make the Harrow narrower, that part of the bar, B, which

Mr. Edward Knight's new Constructed Harrow.





which is faſtened by two pins, *b b*, to be taken off, when requiſite; part of the axle-tree, and part of the hind bar, C, which are faſtened likewiſe by the iron-bolt, D, to be alſo removed; and the remaining outward parts to be joined and faſtened by one of the two pins in the bar, and by a ſhorter bolt, *d*, intended for the axle-tree and hind bar.

If the farmer ſhould work two horſes, which are unequal in height, the horizontal direction or evenneſs of the joints may be deſtroyed in ſome degree; and, to remedy and ſupply this deficiency in the horſes, I have made a whipple-tree, E, to be heightened or lowered, by means of notches, *e e*, to which it is connected by a ring. In light barley-lands, when you accommodate your Harrow for one horſe, by narrowing it as before directed, there are two ſtrings conveyed by two rings from the axle-tree, through two loops, *f f*, under the front bar. The wheel, F, under the hind bar, which is alſo ſhewn enlarged in the Print, at F, will ſupport the bar, and, by this aſſiſtance,

the Harrow is conveyed to the field on the axle-tree bar, as a ſubſtitute for a ſledge: there are alſo two wooden pegs, *g g*, by which the Harrows, when turned upon the carriage, are ſecured.

Should it be objected by ſome, that the Harrow will prove expenſive, on account of the iron, an axle-tree and joints may be readily conſtructed in wood, upon the ſame principles, as ſhewn in the Plate at G; though, for my own part, I give much the preference to iron. If the wheel under the hind bar ſhould not be adopted, there is a ſlider, H, which works with a pin, and, when not wanted, is turned and faſtened under the axle-tree.

EDWARD KNIGHT.

Great Baraſield,
near Braintree, Eſſex.

To the Society for the Encouragement of Arts, Manufactures, and Commerce.

WE, the underſigned, occupiers of lands and others, in the neighbourhood of Edward Knight, have ſeen the Harrow

Harrow at work, as repreſented in the Plate, and find it anſwer every expectation. We find it very convenient in the turnings. We are perfectly ſatisfied that it is much eaſier to the horſes; and the additional improvement of the joints gives a ſteadineſs in the furrow, whenever the horſes prove untractable: the wheels are likewiſe the means of the horſes taking an equal ſhare in the draught. We beg further to expreſs our good opinion of John Knight, Edward Knight's workman, as a perſon well ſkilled in the practical part of huſbandry; and have taken the liberty of incloſing his certificate.

Great Bardfield, Eſſex.

WM. PHILLIPS, Vicar.

W. POLLETT, ſen.
WM. POLLETT, jun.
THO. SMITH,
G. SMITH, jun.
JOS. SMITH,
G. HICKS,
THO. KNIGHT.

I, JOHN KNIGHT, having conſtantly uſed the Harrow, as repreſented by Edward Knight's model, do find it anſwer the intended purpoſe, and that without exception, in my opinion; and I am thoroughly convinced, that, by this improvement, two horſes will in moſt reſpects anſwer the purpoſe of three.

JOHN KNIGHT.

Great Bardfield, Nov. 9, 1795.

FRIEND MORE,

AGREEABLY to thy requeſt, at foot is the price (or thereabouts) of a ſet of Harrows and carriage, according to the model ſent to the Society for the Encouragement of Arts, &c. and may inform the Society, the Harrows have been uſed on my farm more than twelve months. I find them particularly uſeful this wet ſeed-time, as two horſes do the work of three, and always go in the furrow, otherwiſe muſt go on the middle of what we call the ſtech; others call them broad lands. I

alſo

alſo find them (that is the wheels with a ſhort axle-tree) very uſeful with my crab-harrow, more than a horſe's draught difference; and remain

Thy friend,

EDWARD KNIGHT.

	£.	s.	d.
The carriage for the Harrows —	1	1	0
Two Whipple-trees — —	0	1	0
56lb. of hammered Iron, at 6d. or 60lb. caſt ditto, at 2d. (10s.)	1	8	0
A pair of Wheels with Iron-work, or a pair of ſecond-hand ditto, 12s.	2	3	0
	4	13	0

	£.	s.	d.
Or, with ſecond-hand Wheels and Caſt-iron	2	4	0
Three pair of Harrows complete —	2	0	0

If the Frame is made to take ſhorter, as repreſented in the model, 9s. extra.

P. S. Although my Harrows anſwer every purpoſe, as deſcribed before, and repreſented by my model; yet I flatter myſelf I have diſcovered an improvement, which I beg leave to lay before the Society.

Experience

Experience teaches me, it would be very uſeful to heighten or lower the Harrows occaſionally, particularly on broad lands riſing in the middle, where of courſe the middle Harrow takes moſt hold, and generally requires the leaſt: this is eaſily effected, by fixing an iron with notches (like thoſe on the fore bar, by which the whipple-trees are ſupported) on the hind bar, inſtead of the hooks, and the hooks put on thoſe irons.

The

The GOLD MEDAL was this Seſſion voted to THOMAS SKIP DYOT BUCKNALL, Eſq. for his extenſion of Obſervations on ORCHARDING, as communicated in the following Paper.

SIR,

IN this year's Paper I deſire to introduce to the Society ſome valuable additions to the ſcience of Orcharding:

Firſt—The removing trees of the age of twenty years or upwards, to ſupply any deficiencies; by which means the rows in the plantations will be fully kept up, and the Orchard remain perfect, with trees of the ſame age and ſort as thoſe which have decayed or died.

Secondly—The engrafting of new bark upon trees that have beeen injured by cattle, carts, &c. and thus trees kept in a perfect ſtate, which otherways would have died, or ſoon gone to decay. But I wiſh previouſly to impreſs on the minds of the Society, that, in the whole extenſive Orchards throughout

throughout the kingdom, moſt of the ſtandard fruit-trees may be prevented becoming rotten, hollow, or much decayed, until, by great length of time, a dryneſs, want of energy, or by their own weight, they fall into actual diſſolution; and as it is allowed that large trees yield the moſt productive crops, either individually, or per acre, attention ſhould be given to run the trees to ſize; for at preſent there is no competent idea to what extent trees may be induced to grow, by a ſuitable manure and proper management.

The baneful effects of canker may be nearly baniſhed from the more delicate fruit-trees, and the oozing of gum in great meaſure prevented in the different ſpecies of the cherry, and other ſtone fruits.

In the firſt Paper I did myſelf the honour of preſenting to the Society, I repreſented that "pruning is an important article, "with regard to the health of trees, and "their bearing; and, if judiciouſly done, "they will come into bearing ſooner, and "continue in vigour for nearly double their

"common

" common age."—See Vol. XI, page 12. That attentive care which chooſes the proper ſoil; places the trees at due diſtances, according to their natural growth; keeps the branches free and open, that the ſun may paſs over the ground; all being perfectly pruned and regularly cleaned, ſo that the tree may become healthy, round and large, and carefully apply the manure and culture moſt proper for fertilizing the lands appropriated to Orcharding: when theſe advantages ſhall be really united, it may reaſonably be expected that the fruits muſt be larger, finer coloured, freer from ſpecks, and of a richer quality; whence ſuch fruits muſt have a pre-eminence in the markets; or, if originally intended to be thrown into the mill, the cider will be more in quantity, ſtronger, and higher flavoured; proofs of which may eaſily be brought. As I apprehend the Orchards and ſtandard fruit gardens of this country may ſoon be eſtimated at ſome hundred thouſand acres, and ſhould expect from the improvements attempted to be introduced, that in ten

years time each acre, on an average, will increaſe by the improved culture to more than one pound per acre in value per annum, I hope it will not be thought arrogant in me to ſay, that I look upon myſelf as being the actual means of benefiting my country to the amount of more than three hundred thouſand pounds a year.

And if Orchardiſts will conſider this poſition to be founded in truth, it will be an incitement to their exertions. The premiums offered by the Society to promote the proper planting and culture of Orchards, it is expected will ſpread emulation among the planters and, (aided by the extenſive improvements of inland navigation, by which fruit and cider may be conveyed from one extremity of the kingdom to the other), the culture of Orchards may be regarded as a national concern.

When pruning ſhall be fully underſtood, and generally practiſed, the benefits reſulting therefrom will appear to be much more the effect of judgment than the reſult of actual labour; for I have often mentioned,

among

among my friends, my expectation, when the trees are properly brought into order, the whole ſyſtem will be little other than penknife-pruning, except what may ariſe from accident or neglect. So far from wiſhing to have large limbs wantonly taken from trees, the rule is, "keep the branches "out of the reach of cattle, then let them "follow their natural growth." (Vol. XII, page 211): this would ſoon be verified, if a few proprietors and cottagers conſidered the nature of this buſineſs, and began pruning their own trees from the firſt planting, by way of example. When the cottager comes to prune his maſter's trees, then will each concur in opinion, for it depends more upon the mind than upon the hand; and yet there is no myſtery—the the maſter ſpeaking, the cottager comprehends his directions, and thus the work would go on properly. In Mr. Boulding's Certificate (Vol. XI, page 22) "we were "ſometimes in doubt whether a particular "branch ſhould be taken off or not; the "rule eſtabliſhed was, conſider, will that

" branch be in the way three years hence?
" if it will, the ſooner it is off the better."

I have taken much pains to correct prejudice and eſtabliſh a rational culture, and have no doubt but it will become general; yet, I muſt confeſs, I ſhould like to ſee it fully eſtabliſhed in my own time. The whole ſyſtem is grounded on the regular operations of nature in the productions of vegetation: the advantages are fully explained in the reſpective Papers; and, for the mere labourer, there is a ſhort abſtract and inſtructions in Vol. XIII, page 170. I have reconſidered every thought, and find them all concenter in the ſingle word HEALTH.

My chief inducement in writing on the art of Pruning, was to reſcue ſo valuable a branch of Agriculture from neglect, or from the more deſtructive manner in which the work has hitherto been performed. Obſerve in my new ſyſtem, " the trees continue of the ſame ſize
" both before and after pruning, and all the
" extreme ſhoots keep at the ſame diſtance,
" which

" which is an improvement not before " brought into practice." (Vol. XII, page 212).

I have undertaken to produce four apple-trees within the ſame incloſure, each of which ſhall cover ten poles of ground long before they fall into actual decay; and for that purpoſe have meaſured four trees on the north ſide of Sittingbourne, in an orchard belonging to a gentleman at Maidſtone; and, with proper management, there is no doubt but they may be brought to that ſize. As they ſtand cloſe to the road, where they will be under general obſervation, I ſhould think, if a viſible improvement becomes apparent in trees thus marked for public trial, it would counteract the negligent habit of ſtill ſuffering large trees to continue ſo incumbered; theſe trees are of great magnitude, and cannot be leſs than an hundred years old; are in high health; yet much overrun with ſtumps, dead wood, moſs, &c. I remember the ground more than forty years, and think if my ſyſtem had been introduced when that orchard

was firſt planted, there would have been, inſtead of four trees, at leaſt ten times that number, and of equal value. I muſt ſay they are noble trees, and might become beautiful, if that epithet may with propriety be applied to an apple-tree. I have had a long correſpondence with the gentleman, either to purchaſe the Orchard, or to have the liberty of pruning thoſe trees *gratis*; and, under ſuch permiſſion, I have determined not a branch ſhall be touched, but with conſent of the tenant: I muſt not ſay more upon this ſubject until I know the reſult; if I am diſappointed, there are other trees in the neighbourhood of the ſame age, but they are neither ſo healthy, nor ſo well ſuited for my purpoſe.

Several times I have been aſked how much an old tree ought to be pruned?—The proper anſwer would be, if it be very old, and much incumbered, do not let in the cold winds; but, with care, take off the ſtumps, with all the decayed, rotten, and blighted branches, leaving the reſt to the diſcretion of each perſon, who will ſoon ſee how

how much is neceſſary; ſelf-conviction being the beſt ſchool for improvement. The truth is, whoever would form Orchards to produce credit to himſelf and profit to his ſucceſſor, muſt not ſuffer the trees to become old before the operations commence, but determine that pruning, cleaning, and rubbing off the rotten bark, ſhould be begun in the nurſery, and regularly continued to the extremity of old-age; from which method very little wood need be taken off at a time; and, by uſing medication, the wounds will heal, without cauſing any more blemiſhes than the tree was ſubject to at the time the limb was taken off; for it is not the firſt cutting which blemiſhes the tree, but the corroſion, ariſing from neglect.

Let each perſon therefore determine that no ſtandard fruit-tree ſhould be ſuffered to remain incumbered with rotten and decaying branches; for theſe, admitting the water into the tree, and contaminating the balſamic virtues of the ſap, lay the foundation of ſure deſtruction to the tree, and furniſh

niſh to inſects a *nidus* under the rotten bark, in which they depoſit their eggs.

I mentioned to Mr. Fauſſet, in the year 1789, as appears in Vol. XI. p. 12 and 15, that the greater part of the miſchief affecting my trees, aroſe from inſects, vermin, and microſcopic animalculæ, getting under the bark, which has the laſt year been more fully elucidated by William Hampſon, of Dewnap, Eſq. in the Thirteenth Volume of Tranſactions, p. 172, under the article Inſects; and the prevention is there ſo properly pointed out by him, that, in the character of Orchardiſt General, I wiſh ſtrongly to enforce the practice. I have often ſeen whole crops of the more delicate apples deſtroyed by the foliage being eaten off in the ſpring: the hardy fruits are not ſo liable to theſe diſaſters, for the ſtrong health of thoſe trees in a great meaſure ſecures them from ſuch depredations.

Laſt ſummer, in Kent, I had much converſation with ſome very intelligent men, on the ſubject of Orcharding and general Agriculture. A gentleman on the hills

ſhewed

ſhewed me ſome large trees, and aſked my opinion.—I replied, Do nothing; for you can gain no credit by them, from the energy or active powers of vegetation having been long exhauſted in thoſe trees: but I pointed out ſome young ones where pruning might be happily applied, and he might make a trial on one of the large ones.

At Brambling, I viſited an Orchard at the requeſt of the owner: the trees required more cleaning than pruning, and I requeſted he would be careful to attend the operation himſelf, and his orchard would become more valuable, by the quantity and quality of the fruit. I recommended him to encloſe the ground, which contained about ſix trees, with hurdles, and he might eaſily unite that ſpot with his pig-ſtyes, and ſuffer the hogs to be conſtantly running over that ground; and, from the manure thus obtained, the trees would receive a viſible energy, which would ſoon appear in the growth of thoſe trees, when compared with the others, and that the improvement of the trees was to be the criterion for him

to

to act by; for the freer the trees grow, the more effectually they recover the pruning, by throwing out young wood: and I remarked, that if the Orchard was my own, I would open the gate, without reward, for the drovers to bring in the yearling cattle, which pass the road from October to Midsummer, for three years; and such practice would double the value of the fruit: I mean, to what it will be ten years hence, for the trees are visibly going off, though now they are just in a state to be recovered.

Last year I recommended cleaning by soap-suds (Vol. XIII. p. 168). A gentleman at Wandsworth uses oil, which has a wonderfully good effect. I should think the oil might be applied about a month after the suds. As I am, in large concerns, a friend to cheapness for the bulk of mankind, I imagine any damaged oil would do: oil certainly is beneficial to trees.

These observations are sufficient to shew that I am attentive, and vary the advice, according to the state and value of the trees.

Some

Some gentlemen in my neighbourhood have made very handſome exertions; but I wiſh to bring the improving trees into univerſal practice, and keeping them in bearing to a great age; and would recommend that perſons, for their own ſatisfaction, ſhould ſelect a certain number of trees, according to their fancy, and mark them in pairs, as to their age, freeneſs of growth, and other circumſtances, ſuitable to trial, prune and manure one, and leave the other in the ſtate of nature; but, for experiment, do not prune two trees, ſtanding next to each other, in the ſame year, when the pre-eminence of the practice will ſoon appear:—ſuch a mode is bringing Orcharding to a fair trial; and, if I had been ſo prudent as to have managed my trees alternately, two-thirds of the growers in Eaſt Kent would have acquired the ſcience before this time. It may appear that I argue this ſubject too ſtrongly; but, when we recollect that the Society has been thirty years engaged, and ſhewn moſt aſſiduous and laudable exertions, aided by many high premiums, to aſcertain

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the comparative advantages of the Drill and Broad-caſt Huſbandry, we muſt ceaſe to wonder that the ſcience of Orcharding has not made greater progreſs.

It is recommended, that the rows of trees ſhould not ſtand north and ſouth, but a point of the compaſs towards the eaſt, as the ſun will then ſhine up the rows ſoon after ten o'clock, which, in the ſpring of the year, will ſerve to diſſipate the vapours collected in the night: theſe vapours ſtunt the fruit in the early ſtages of its growth; and, where the ſhaws are properly attended to, this poſition will beſt enable them to divide and blunt the power of the winds, and prevent blights, and the ſhaw might be a little brought over the ſouth: but, as each ſituation has a predominant wind, this is only hinted to put the planter upon his guard: the ſhaw alſo will greatly protect the fruit from the ſeverity of the autumnal winds, at which ſeaſon half the crop of fruit is thrown from the tree before it is ripe; and the heads at that time of the year being loaded with fruit and leaves, many

trees

trees are actually torn out of the ground, or ſo lacerated as to be ſpoiled, which a proper ſhaw might prevent. Judicious ſhelter ſhould be the firſt object thought of in forming an Orchard on a large ſcale.

Had I been poſſeſſed of ground near my own dwelling, I ſhould ten years ago have planted an extenſive experimental Orchard —it would have given me much pleaſure; but there is no land attainable; and experiments cannot well be conducted at a diſtance, to any great credit, where the only object is to raiſe emulation by way of example.

When I pruned the trees in my Orchards, at Sittingbourne, in the year 1790, they being young, I cut freely, for they were greatly incumbered and decaying, and half the wounds were made by taking off the ſtumps, and cutting down the cankers and gum, as certificates fully prove (Vol. XI. p. 26); and I was certain the trees would be greatly improved by the pruning: but I muſt mention they have not been touched ſince, leſt any perſon who may examine

the

the Orchard by way of obſervation, might confound the former and new wounds together.

Let no one be afraid of the expence, for that is trivial; fourpence-halfpenny per tree once in three years would overpay it, after the trees have been brought into order, if the maſter would only take care they are kept clean, and the caſual accidents duly attended to (ſee Vol. XIII, p. 167). According to my ideas, the age of a tree is not to be conſidered; for the judgment muſt be taken from the energy and freeneſs of growth, as many trees are in a more declining ſtate at ſixteen years than others at an hundred. Since I have mentioned comparative age, obſerve, from ſixteen to twenty is a critical time for the delicate fruits: if they continue in health beyond that period, they generally go on well afterwards; and, upon ſome future occaſion, I ſhall introduce Root-pruning.

Were it neceſſary more fully to enforce the practice of pruning, ſuppoſe an order was given, that all peach-trees ſhould remain

main unpruned for five years: from thence be aſſured, there would ſcarcely be a high-flavoured peach in the kingdom, all either ſour or inſipid. The apple or cherry do not require the ſame care the peach does; yet each are well worthy of attention. I obſerved, in Vol. XII. p. 217, "that ſun-"ſhine and ſhade are unalterably the cauſe "of ſweet and ſour fruits."

Thoſe acquainted with the wine-countries know that the natives beſtow much labour in manure, culture, pruning, and more particularly in bringing the grapes to perfect ripeneſs; and I do not ſee why, in Britain, ſome part of that attention ſhould not be given to the apple.

It is proper here to recommend to nurſerymen, to be attentive to their GRAFTS, for more depends upon it than is imagined; as, from the grafts being full, well wooded, clear, and properly choſen, the fruit will be both larger and higher flavoured. Though the ſoil and culture may be the ſame, the health of the wood of the tree is alſo moſt materially affected during the whole time

of

of the tree's exiſtence, by the proper maturity the ſcion was in at the time it was firſt put into the ſtock.

As this is to be my laſt eſſay, I wiſh to ſend it out as perfect as I can, and beg excuſe for the great length. Let any perſon, whoſe mind has, by precept, been turned to philoſophical enquiries, conſider the following ſtatement: when an Orchard has become old and much encumbered, ſo that the trees, from being too thick, totally overſhade the ground, if one of thoſe trees dies, the four next ſurrounding it will each of them throw out their branches to fill up that void ſpace; the ſap of thoſe four trees tending that way by the active influence of the ſun and air, and the other parts of thoſe trees ſtill remaining incumbered, will of conſequence decline in vegetation; for the energy is drawn the contrary way. Theſe things happen every day, but on the unobſerving eye make little impreſſion. This intuitive energy of nature is not confined to vegetation, for it pervades all nature: then why not ſuppoſe, if a part of a tree is de-

cayed, and you take it out, that Nature is capable of filling up the void ſpace: that ſhe is capable, is moſt undoubted, and ſhe will do it too, if there is any energy left, by ſupplying younger and better-bearing wood than that which is taken away.

Where the trees are ſo cloſe and incumbered, that the agricultural vegetation cannot thrive under them, the fruit from ſuch an Orchard will hardly be large and high-flavoured; neither will it keep ſo well.

Laſt autumn, the delicate fruit-trees were much incommoded with a whitiſh mould or mildew, which I have regularly obſerved to take place in what is called muggy weather; this is what lays the firſt foundation of canker; it was very prevalent about ſeven years back. I have long known it to ariſe from animalculæ ſettling on the wounded parts of the tree, and the ſhoots of the preſent year. In Vol. XIII. p. 169, I pointed out the cure, which is rubbing off with the lard medication; and I recommend to have the ſhoots cut at a large bud; for, when they have been thus

affected, there are but few of them will ſtand the cold of the winter: they generally die off about half way up. I have formerly quite removed the canker from ſome nonpareils, which, after three years medication, threw out ſhoots a yard long: this induced me to ſay, that the mercury gave an energy to the plant; I mean, by the mercury curing the diſeaſe, the plant recovered its energy: any one may ſatisfy himſelf that it is animalculæ, by rubbing a little of the mildew between his thumb and fore finger, when the inſects actually break, and produce a matter like the cochineal fly *(coccus mali)*.

Another circumſtance worthy obſervation is, the cuſtom of attempting to check the too great flow of the ſap, particularly in pear-trees, by cutting a circle through the bark, with the intention to make the tree fruitful; much better would it be, by natural means, to lead the ſap regularly through all the branches; the action of the ſun would then properly impel it to the extreme parts of the tree, for ſwelling the buds

buds, and ſupporting the fruit; and this even flow of ſap is what produces fruitfulneſs, and is implied, Vol. XI. p. 13—"The "more the range of branches ſhoot circu- "larly, the more equally will the ſap be "diſtributed, and the better will the tree "bear."

Let me entreat thoſe intereſted in fruit plantations, to unite in eſtabliſhing and exalting the ſcience of Orcharding, to make it one of the handmaids of Commerce: it is certainly the poor man's friend, the rich man's pleaſure, the pride and ornament of the reſpective ſpots attached to each habitation. View the trees in ſpring unfolding and raiſing their beautiful bloſſoms and leaves up to the eye of Heaven, and in autumn gently bending their pliant branches for the induſtrious hand to gather the fruits. Do not wonder that I ſhould ſhew a little enthuſiaſm for the welfare of a ſcience which I have actually created, and from which I have received much ſatisfaction.

The Ancients had their goddeſs Pomona, to whom they paid divine honours, which goddeſs was no other than an ideal ſuperintendency ſuppoſed to preſide over Orchards; which is a moſt convincing proof that they held the culture of fruits in high eſtimation.

Through the whole proceſs I have confined my inſtructions to ſtandard trees; but now ſay, they are equally applicable to fruits in general, even to the hawthorn, whoſe bloſſoms in ſpring, and fruit for the birds in autumn, make it worth ſome attention in parks, and ſuch plantations.

For the full eſtabliſhment of the art, nothing more is neceſſary, than to gain two or three capital land-owners in each diſtrict, who occupy their own eſtates, and influence them to examine the ſyſtem, and follow it, from which much improvement muſt reſult. In every ſcience the principles muſt be underſtood before the practice can become general. I am, SIR,

Your moſt humble ſervant,

T. SKIP DYOT BUCKNALL.

Hampton Court,
Jan. 6, 1796.

Mr. MORE.

The following Account of an Experiment made by Mr. Lake, and the Extract of a Letter from William Fairman, Esq. will throw great light on the Method of removing large Fruit-Trees, and engrafting new Bark on such Trees as may have been injured by the bark being stripped off by sheep, or any other accident; and it will be seen that, in the same Letter, Mr. Fairman gives a decided opinion on the appearance of the Fruit-Trees pruned under Mr. Bucknall's immediate inspection. Also, an Account from Sir John Morshead, Bart.

Removing large Fruit-Trees.

MR. LAKE, of Bapchild, in the year 1790, asked me if I could help him to remove about sixty cherry-trees? I did not think his reason to alter their situation sufficient to justify the expence, and attempted to dissuade him from it; but he persisting, I said, If you will order a semi-circular board, such as the bricklayers turn their

arches upon, of three feet ſix inches diameter, in which cut a center, and with a ſmall ſpade dig a trench round the tree below the roots; afterwards cut the ends of the roots with a ſharp knife, and fill up the trench again; the year after thin the head very much, that the wind may have no power over it; and the next year ſo diſpoſe the young ſuckers as to lay the foundation for a handſome head in future; and with theſe precautions you may venture to carry the trees farther than you want: but do not lighten the head the firſt year, as you will want the power of the head to make the roots work and throw out young fibres, and, at the time the trees are taken up, the roots will have many fibres; and as from this practice neither roots or head will have any wounds to heal the year the tree is removed, its growth will be greatly accelerated when the tree comes into the new ſituation.

All this was regularly done, and the trees removed in September, 1794. For further information, I refer to Mr. Lake, who is a good

a good orchardiſt, and will gladly anſwer any queſtion; but am fearful, from the ſeverity of the froſts of that winter, he will not be able to ſend proper certificates of the ſucceſs till next year; for, when I was there in May, 1795, they were very backward. However, this removing of large trees muſt come into this report; becauſe I beg of every planter, who wiſhes to do ſomething worthy of the premiums, that he will order a certain number of trees, more than his new plantation requires, and place them in a retired part, to keep up his plantation; and then he will ſay, "A friend in "need is a friend indeed;" for ſuch trees cannot be bought. If they are to come far, all the precautions are loſt, from the fibres of the roots getting dry. I have practiſed this before, and will anſwer for the ſucceſs.

Engrafting Bark on injured Trees.

In July I ſpent two days with Mr. Fairman, at Lynſted, in converſation on the

ſcience of Orcharding and general Agriculture; and he mentioned a misfortune which befell one of his Orchards in the preceding winter. Some fatting ſheep, in the ſeverity of the froſt, tore off the bark from many trees, actually quite round. Mr. Fairman was ſo hurt by the accident, that he was determined to do ſomething, if poſſible, to ſave the trees; and it came into his mind to try whether, if new bark was bound upon the wounds, it would adhere.

I am, SIR,

Your moſt humble ſervant,

T. SKIP DYOTT BUCKNALL.

Hampton Court,
March, 1796.

Mr. MORE.

SIR,

MR. BUCKNALL having an Orchard in my neighbourhood, I took an opportunity, a few days ſince, of examining the trees which were pruned under his

his immediate direction; and, I must confess, I was highly pleased with the beautiful form and appearance of most of them, finding my ideas were so skilfully anticipated: I expected to have found he had been too free with his instruments, from knowing his motive for pruning is to produce the fruit larger, clearer, and higher flavoured.

As I am an extensive grower of fruit, having about sixty acres chiefly on my own estate, the business cannot be indifferent to me; and I shall be happy in following any information tending to the improvement of so valuable a branch of the agriculture of our county.

My inducement for troubling you is, to introduce a method of recovering apple-trees, which may have been stripped of their bark by sheep, or any other accident; and, for the information of the Society, I must desire you will acquaint them, that, in the severity of the spring of 1794, some fatted sheep were turned into a valuable Orchard of mine, of about twenty years growth, and they in a short time actually stripped

ſtripped the bark from ſeveral of the trees, entirely round the bodies, leaving the wood bare for at leaſt ſixteen inches.

I was ſo much hurt by the accident, as to determine to do ſomething for the preſervation of the trees, and ſave them if poſſible. The firſt ſtep which I took was to take off the arms from ſeveral of the trees which were moſt injured; and, from the largeſt of thoſe arms, I ſlawed off ſlips of rind of about two or three inches in width, and placed four or five of them perpendicularly round the naked part of the body; but I ſhould obſerve, that I firſt cut away all the rind that was bitten, and then raiſed the rind up, top and bottom, and put the ends of the ſlips under, that the ſap might circulate; and afterwards bound them exceedingly tight with rope-yarn: I then applied a compoſition of loam and cow-dung, with a little drift-ſand, over which I tied ſome old ſacking; which was the whole of the proceſs.

Mr. Dyot Bucknall, perceiving this method very likely to ſucceed, requeſted I would help

help to give a recital, the heads of which we wrote on the ſpot, and he aſſured me he had ſent them to you: but, leſt he may have made any miſtake, he wiſhed I would ſend the account myſelf.

The experiment being made in the ſpring of 1794, a minute inſpection at this time muſt determine the fate of it; and permit me to aſſure you, it has ſucceeded far beyond my expectation: the ſlips adhere as cloſe, and are as full of ſap, as the rind on any other trees. They are now in their full bloſſom, ſtrong, and vigorous, apparently as if they had received no injury. But I muſt obſerve, were I to make the experiment again, I could do it more dexterouſly; and I muſt mention an error I was guilty of in my haſte, by placing ſome of the ſlips the wrong way upwards; conſequently the ſap could not circulate.

I am, SIR,

Your moſt humble ſervant,

WM. FAIRMAN.

Miller's Houſe, Lynſted, Kent,
May 16, 1794.

Mr. MORE.

SIR,

SIR,

MR. DYOT BUCKNALL having mentioned in his report of this year, that ſome gentlemen of this neighbourhood had made great exertions in the ſcience of Orcharding, and finding that the Society expect certificates of all matters that are to be introduced into their Tranſactions, I feel it neceſſary to inform you, that, in the autumn of 1794, I began to practice cloſe pruning and medication, according to Mr. Bucknall's directions, on a great variety of fruit-trees, of all ages, and that I find it anſwer far beyond my expectation; particularly in two very material points, the deſtroying of canker, and ſtopping the oozing of gum; and I am ſo well convinced of the great advantages to be derived from Mr. Bucknall's ſyſtem of cloſe pruning and medication, that I ſhall continue to practice it on a large ſcale myſelf, and ſhall alſo recommend it ſtrongly to my friends and tenants in

the county of Cornwall. I have the honour to be,

SIR,

Your moſt humble ſervant,

JOHN MORSHEAD.

Hampton,
January 17, 1796.

Mr. MORE.

The

The Thanks of the Society were this Seſſion given to RICHARD RAMSDEN BRAMLEY, Eſq. for the following Paper on a Method of conſtructing BANKS to guard againſt the Inundation of the Sea.

THE procuring of new ſcenes, on which induſtry may act with profit, is ſo deſirable an object, that I hope the Society's excuſe for introducing an idea, which, ſhould it anſwer, may be of conſiderable utility, and which is, the application of the ſyſtem of puddling in embankments made near to the ſea, and liable to be overflowed at ſpring-tides. In ſuch ſituations, water is to be found almoſt with certainty at a few feet under the ſurface; and the great bar to incloſure or embankment in ſuch ſituations being the difficulty which occurs in giving ſufficient denſity to the bank, and thereby enabling it to reſiſt the ſpring-tides, the following mode would, it is ſuppoſed (where a ſmall portion of ooze is intermixed with the ſand), be capable of binding the ſame ſo firmly, as to give it a denſity ſufficient

cient to reſiſt the impulſe of the tide. Having firſt laid out, ideally, the ground intended to be embanked, it will be neceſſary to fix pumps at one or both ends of, or more ſpaces in the line, capable of throwing up conſiderable quantities of water; and, in proportion to the work intended to be done, to have extra hands, rather than be in any reſpect deficient: the line ſhould then be drawn with a convexity to the water, and the ſoil dug over and puddled as a baſe, continuing the ſame mode for every five or ſix inches thickneſs of ſoil thrown on above the ſurface, and guarded by an external wall of looſe earth or ſilt: the pumps at each end ſhould be ſet to work, making a channel for the water to run centrally along the bank, and, as faſt as it could proceed, to have parties ſtationed ready to puddle it nearly from ſide to ſide; which being brought to a proper conſiſtence, another layer ſhould be thrown thereon, and in a curving ſhape, narrowing upwards from the baſe: the ſame proceſs in puddling ſhould be then renewed, and alternate applications

plications of freſh ſoil and puddling be proceeded on, until the bank is raiſed to the height ſufficient to guard againſt the higheſt tides.

Earth in this puddled ſtate becomes ſo denſe as to reſiſt the impreſſion of water, which can by no means penetrate it; and, though the experiment has not to my knowledge been before thought of, or tried in ſuch ſituation, yet I apprehend it will, by this means, acquire a compactneſs of ſubſtance, ſufficient to withſtand every common effort of the tides: after it is once completed, and by ſtrewing a few hay-ſeeds on the curving ſides, it would probably ſoon be covered with a complete greenſward, which would be forwarded much by the moiſture exhaling from the adjoining puddled earth; thus anſwering the double purpoſe, of making the internal earth coheſive, and promoting vegetation on the ſurface. The idea originated in reflecting on the ſolidity attained in the puddled banks of canals, &c. which mode might probably be thus applied to purpoſes of unbounded utility;

utility; and where under-drains are neceſſary to quit land-floods or ſtreams, care might be taken, prior to forming the bank, to leave proper vacancies for their reception, after its completion. Should theſe hints be thought worthy of attention by the Society, I hope their public recommendation will induce a trial to prove the efficacy; and the hearing of attendant ſucceſs will give a great pleaſure to one who wiſhes to promote every object conducive to the progreſs of Agriculture.

I am, SIR,

Your moſt obedient ſervant,

RD. RAMSDEN BRAMLEY.

Leeds, Feb. 6, 1796.

Mr. MORE.

A Bounty of FIFTY GUINEAS was this Seſſion voted to Mr. RICHARD EAGER, of Graffham Farm, near Guildford, Surry, for communicating to the Society his ſimple yet effectual Method of relieving CATTLE and SHEEP, when, from eating too voraciouſly of Clover, or any other ſucculent food, they became ſwollen, or, in the language of the farmer, *hoven*; and which, previous to this diſcovery, has been attempted to be cured by ſtabbing them into the paunch; a method of proceeding always dangerous, and very frequently fatal to the animal. A Cut of the Inſtrument invented by Mr. EAGER is annexed to the Deſcription, and is ſo ſimple that it may be procured at a very reaſonable price.

SIR,

MR. EAGER tells me that he has ſent up two of his inſtruments to you, with directions. In the encloſed Paper

Paper he explains the principle of the diſeaſe, and of the cure. I am convinced that he is right, and that the Hoven of Cattle is ſolely occaſioned by the vent upwards, for the wind, being obſtructed; which obſtruction his inſtrument removes; and I believe it to be an eaſy and infallible cure.

I am

Your very humble ſervant,

EGREMONT.

Mr. MORE.

MY LORD,

AS you have been ſo kind as to offer to forward for me, to the Society for the Encouragement of Arts, Manufactures, and Commerce, my obſervations on Bullocks and Sheep, and why, in my opinion, they are more liable to be blown or hoven with young clover, rape, or turneps, than with any other food, I have taken the liberty to encloſe this to your Lordſhip, for that Society's conſideration.

As young clover, rape, and turneps, are of a ſucculent nature, Cattle are induced to eat more than they otherwiſe would do: the extra quantity of fixed air which that ſort of food produces, more than common graſs, makes the Cattle more liable to be blown with that than any other food: the extra quantity of fixed air taken down by ſuch food more than by other graſs, occaſions the neceſſity of more wind being diſcharged from the paunch of the beaſt upwards: this forces the broad leaves before the paſſage at the entrance of the paunch, which ſtops the wind from going upwards in its regular courſe: the paunch immediately begins to ſwell; the heat of the body rarifies the air in ſo rapid a manner, that it ſtops the circulation of the blood, and the beaſt, whether Bullock or Sheep, is dead in half an hour.

I have ſent two of my inſtruments, one for Bullocks, the other for Sheep, directed to Samuel More, Eſq. Adelphi, London, for the inſpection of the Society, with directions for uſing them; and, as hundreds

of

of Cattle may be ſaved every year by this ſimple inſtrument, and the Inventor's wiſh is the public good, whatever the Gentlemen of that Society ſhall think due to my merit for the invention, it will be received with pleaſure, by

Your Lordſhip's much obliged

and moſt humble ſervant,

RICHARD EAGER.

Graffham Farm,
near Guildford,
March 2, 1796.

EARL of EGREMONT.

SIR,

I RECEIVED yours of the 12th inſtant, and have ſent you proper directions for uſing my inſtruments; likewiſe the inſtrument for removing either turneps or potatoes, if a Bullock gets them in his throat, when fed with either of thoſe roots, which inſtrument I have found to be very uſeful in ſuch caſes. I have ſaved two of my own

this winter. I have begged the favour of Lord Egremont to write you his opinion of the utility of my inſtruments, as he has had an opportunity of trying them often with ſucceſs.

I am, SIR,

Your very humble ſervant,

RICHARD EAGER.

Graffham Farm,
near Guildford,
April 23, 1796.

Mr. MORE.

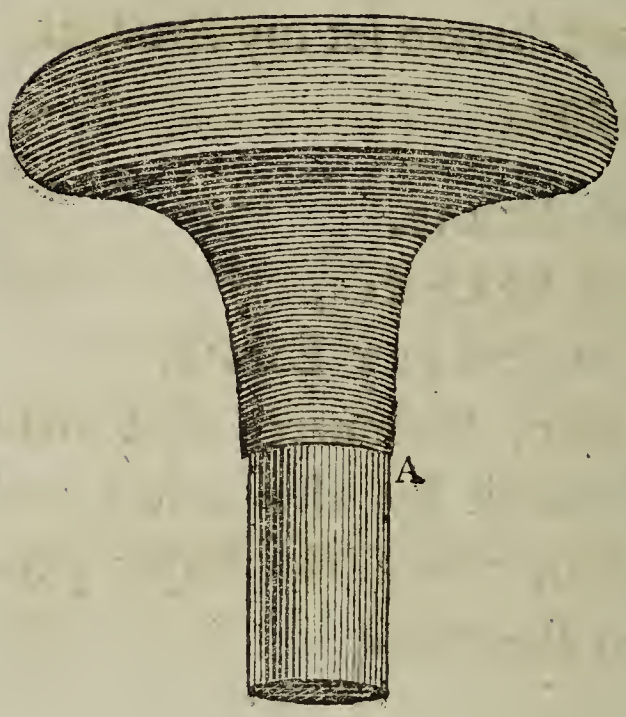
THIS is to certify, that I, Charles Ellis, of Noar Farm, in the pariſh of Bramley, in the county of Surrey, had an ox violently ſtrung or hoven, and muſt have died in a ſhort time; knowing my neighbour Mr. Richard Eager had invented an inſtrument for relieving Hoven Cattle, I ſent to him, who immediately applied his inſtrument, which effectually cured my bullock in two minutes: the ox returned to his food, and, in leſs than half an hour, eat

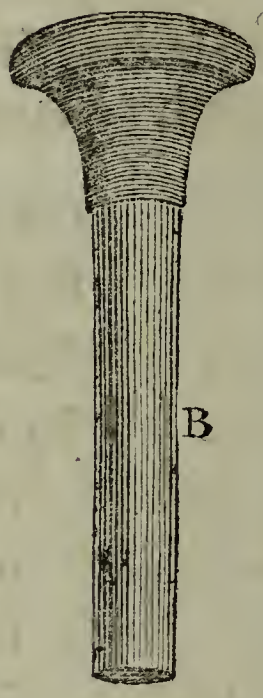
as

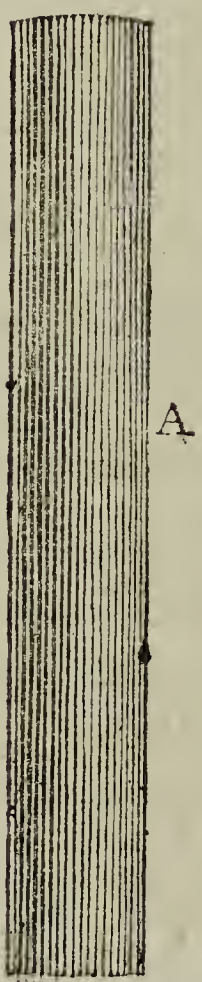
as hearty as he did before. In juſtice to Mr. Eager, I have hereto ſet my hand, this 25th of April, 1796.

CHARLES ELLIS,
RICHARD SPARKES,
RICHARD STREET ELLIS,
JOHN LUFF, Labourer, who held the Bullock by the noſtril and one horn, while Mr. Eager performed the cure.

Mr. EAGER's *Inſtrument for relieving Hoven Cattle.*







Explanation of the Cut of Mr. Eager's Contrivance for relieving Hoven Cattle.

A. A. The knob of wood, and part of the cane to which it is fixed, of a proper ſize for oxen: the length of the cane to be at leaſt ſix feet.

B. B. The knob of wood, and part of the cane, for ſheep: the length of the cane to be about three feet.

Directions for uſing Mr. Eager's Inſtrument.

Let one man take the beaſt by the noſtril and one horn, the other take the bullock's tongue faſt in one hand, putting the cane down his throat with the other. Be careful not to let the bullock get the knob of the cane into his grinders. Obſerve to put the cane far enough; the whole length will not injure. You will find the obſtacle at the entrance of the paunch: puſh the cane

cane hard, and when you find the ſmell from the paunch, and the bullock's body to ſink, the remedy is performed, and nature will act for itſelf.

PAPER

IN

CHEMISTRY.

CHEMISTRY.

To obtain pure and unadulterated thoſe Drugs that are of peculiar efficacy in Medicine, is univerſally allowed to be an object highly deſerving public attention: the Society, therefore, conſidering how much the practice of Phyſic would be advantaged by procuring a Drug of ſo much conſequence as Opium, in an unſophiſticated ſtate, have this Seſſion, after due trials of ſome Opium prepared from Poppies grown in England, given FIFTY GUINEAS to Mr. JOHN BALL, of Williton, for the diſcovery of his Method of preparing it, and which, from the authority of ſeveral eminent Phyſicians who made trial of the Opium, and whoſe Letters are here inſerted, it is hoped will prove an advantageous diſcovery.

SIR,

SIR,

BY the favour of my worthy friend Dr. Brockelsby, I have taken the liberty to send a small pot of Opium, which I have extracted this year from a few poppy heads in my garden, and request of you to present it to the Society, with my most respectful compliments: as I make no doubt it may be brought to the greatest perfection in this country, and rendered at one half the price at which we have it from the East, and without the least adulteration; and should be extremely obliged to you, if you would be so kind as to send a part of it to one or two of the principal hospitals for trial. I am of opinion a smaller quantity will answer, as I am informed that what we have from abroad is mixed with rice flour and other adulterations.

I am

Your most humble servant,

JOHN BALL.

Williton
Aug. 13, 1796.

Mr. MORE.

SIR,

SIR,

YOUR obliging letter of the 21ſt of November, reſpecting the ſample of Opium I received, which ſhould have anſwered, but was then confined with a ſevere fit of the gout: am exceedingly obliged for the trouble I have given, and beg leave to inform you, that my intention of ſending the Opium to you was, firſt, in order to have a fair trial made, and, if approved, to make it known to the Society, for the good of the public at large; but at the ſame time muſt ſay, that I expect a pecuniary reward, particularly from ſuch a reſpectable and opulent Society.

I think amazing quantities are conſumed every year; and am of opinion, that there is twenty times more Opium uſed now in England only, than there was fifteen or twenty years ſince, as great quantities are uſed in outward applications, and it is continually advancing in price, which con-

vinces me of the great demand for it. As you ſay in yours, that you would wiſh to know what reward I expect for making it public to the Society, I ſhould think not leſs than fifty guineas, being aſſured of its anſwering every good purpoſe; and make no doubt but we ſhall have Opium Contractors in the Weſt, and full as able to export, or even better than the Turks, being the makers as well as the exporters; the Turks being only the latter, having their Opium from the Eaſt.

I am, SIR,

Your moſt humble ſervant,

JOHN BALL.

Williton,
December 14, 1794.

Mr. MORE.

SIR,

I HAVE this poſt received yours reſpecting the Opium, and beg leave to acquaint the Society, that what I meant in my former letter, by the term half-price,

was generally for one half leſs than what we give the druggiſt in London. I have been offered, and have partly agreed with a druggiſt in town, for all the Opium I ſhall make this year, at the ſame price which Opium from the Eaſt ſhall be at that time; and I make no doubt but, when it is publicly known, that in the courſe of a very few years we ſhall be able to render it from five to eight ſhillings per pound, without the leaſt adulteration; and I am likewiſe of opinion, that the moſt barren ground, which in ſome places lets from two to ten ſhillings an acre, will, with very little expence, anſwer for the growth of Poppies. I ſhall take care this ſummer to find out, if any one particular ſort or colour produces the moſt Opium.

I am, SIR,

Your obedient humble ſervant,

JOHN BALL.

Williton,
April 27, 1795.

Mr. MORE.

SIR,

HAVE this poſt received yours reſpecting the reſolution of the Society to give me fifty guineas for the diſcovery of the proceſs for obtaining Opium from Poppies grown in Great-Britain; and, as you wiſh for an immediate anſwer, muſt beg that you will preſent my moſt reſpectful compliments, and that I agree to accept of the conditions ſtipulated in their reſolutions; and, in the courſe of a week, I will communicate to the Society the whole proceſs.

I am, SIR,

Your very humble ſervant,

JOHN BALL.

Williton,
May 25, 1795.

Mr. MORE.

MY LORDS AND GENTLEMEN,

BY your Secretary, Mr. More, I received your reſolutions reſpecting your purchaſing from me the mode of my preparing the

the ſample of Opium which I took the liberty of ſending to you for your particular inſpection, and at the ſame time to beg the favour of your having a ſufficient trial of its properties, which I find you have been ſo obliging as to have done; and likewiſe have granted to me the fifty guineas as a purchaſe of my method of preparing Opium; for which you have my ſincere thanks; and I am exceedingly pleaſed to find, that it was thought worthy the notice of ſo honourable and reſpectable a Society; and am ſatisfied there can be no other mode of preparing or collecting the true and genuine Opium, than what follows.

Nothing can be more ſimple, or attended with leſs expence, than the making or extracting the pure and genuine Opium from the large Poppies, commonly called or known by the name of Garden Poppies; the ſeeds of which I would adviſe to be ſown the latter end of February, and again about the ſecond week in March, in beds three feet and an half wide, well prepared

with good rotten dung, and often turned or ploughed, in order to mix it well and have it fine, either in ſmall drills, three in each bed, in the manner ſallads are ſown, and, when about two inches high, to thin them one foot apart; or otherwiſe, to ſow them in beds in the broad-caſt way, and thin them to the ſame diſtance (if the weather ſhould prove wet at that time, thoſe that are taken up may be tranſplanted; but I do not ſuppoſe the tranſplanted ones will anſwer, having but one ſpill-root, and will require frequent waterings): keep them free from weeds, they will grow well, and produce from four to ten heads, ſhewing large and different-coloured flowers, which, when the leaves die away and drop off, the pods then being in a green ſtate, is the proper time for extracting the Opium, by making four or five ſmall longitudinal inciſions with a ſharp-pointed knife, about one inch long, on one ſide only of the head or pod, juſt through the ſcarf-ſkin, taking care not to cut to the ſeeds: immediately on the inciſion being made, a milky fluid will

will iſſue out, which is the Opium, and, being of a glutinous nature or ſubſtance, will adhere to the bottom of the inciſion; but ſome are ſo luxuriant, that it will drop from the pod on the leaves underneath. The next day, if the weather ſhould be fine, and a good deal of ſun-ſhine, the Opium will be found a greyiſh ſubſtance, and ſome almoſt turning black: it is then to be ſcraped off the pods, and, if any, from the leaves, with the edge of a knife or an inſtrument for that purpoſe, into pans or pots; and in a day or two it will be of a proper conſiſtence to make into a maſs, and to be potted.

As ſoon as you have taken away all the Opium from one ſide of the pod, then make inciſions on the oppoſite ſide, and proceed in the ſame manner. The reaſon of my not making the inciſions all around at the firſt, is, that you cannot ſo conveniently take away the Opium; but every perſon, upon trial, will be the beſt judge. Children may with eaſe be ſoon taught to make the inciſions,

and take off the Opium; ſo that the expence will be found exceedingly trifling.

The ſmall white ſeeds in that ſtate will be found very ſweet and pleaſant, and may be eat without the leaſt danger; and it is the cuſtom in the Eaſt to carry a plate of them to the table, after dinner, with other fruits.

I intend this year to keep apart a ſmall quantity of Opium from each coloured Poppy, to find out if any one more than another produces the greateſt quantity, or of the greateſt ſtrength; and ſhall ſave ſeeds of each, to ſow ſeparately the next ſpring.

I am of opinion, that numbers of incloſures taken from hills in a ſouth aſpect, with a very little expence, may be brought into a proper ſtate for the growth of Poppies.

I ſhould think that an inſtrument may be made of a concave form, with four or five pointed lances, about the twelfth or fourteenth part of an inch, to make the in-

ciſions at once; and likewiſe ſomething of the rake-kind, ſo that the three drills which I have directed to be made in each bed, may be performed at the ſame time.

By a calculation which I have made, ſuppoſing one poppy, growing in one ſquare foot of earth, and producing only one grain of Opium, more than fifty pounds will be collected from off one ſtatute acre of land; but, upon recollecting that one Poppy produces from three, four, to ten heads, and in each from ſix to ten inciſions are made; and I am poſitive, from many of them (I mean one inciſion), the laſt year, I took away two or three grains. What muſt then be the produce? Opium is now twenty-two ſhillings the pound.

I am,

MY LORDS AND GENTLEMEN,

Your moſt obliged and moſt devoted humble ſervant,

JOHN BALL.

Williton,
June 2, 1795.

SIR,

I HAVE this day ſent you, by the coach from Bridgewater, the Opium which I promiſed you; and take this opportunity of informing you reſpecting the Poppies. If you recollect, I was fearful that the tranſplanted ones would not anſwer, and am now convinced, having a large quantity of Poppies which had ſown themſelves: when of a proper ſize, I tranſplanted about four thouſand in beds, but not one ſingle plant came to perfection; therefore, ſhall never tranſplant any more; and, not having ſaved any ſeeds the laſt year, owing to my not being at home at the proper time, I could not ſow any. The bed where the Poppies had ſown themſelves was five hundred and ſeventy-ſix feet ſquare, from which I collected about four ounces of Opium, notwithſtanding the plants were very thick; and, to ſhew you the advantage of giving them ſufficient room, from ſome few plants which were detached, I took from fifteen to thirty-four grains: theſe had ſown themſelves

ſelves on ground that had been well manured with rotten dung, which points out the utility of good cultivation: the ſemi-double, and thoſe of a dark colour, produced the moſt Opium. The pods ſhould be about the ſize of a walnut, before you make the inciſion: the dried poppy-heads which I had from the druggiſt in London, are full three times as big as what mine are, conſequently muſt produce a much greater quantity of Opium.

I am, SIR,

Your moſt humble ſervant,

JOHN BALL.

Williton,
Auguſt 22, 1795.

Mr. MORE.

SIR,

I RECEIVED the favour of your letter dated the 10th inſtant, by which I find you have extracted ſome Opium from ſingle Poppies; if you will pleaſe to advert to my

letter of inſtructions for ſuch purpoſe, I ſaid I had collected my Opium from double or ſemi-double Poppies, which accidentally grew in my garden; by which I find the produce to be more than double what you collected from the ſingle: as a proof, I will do myſelf the pleaſure of ſending you ſome Opium, which I have abſolutely collected myſelf this year from one Poppy; I ſhould ſuppoſe it more than thirty grains: twenty-eight heads grew on that Poppy: it was of the ſemi-double kind. I ſhall likewiſe ſend you ſome of the heads from which I extracted the Opium, being far preferable to the ſingle, as appears from the produce of each.

I remain, SIR,

Your very humble ſervant,

JOHN BALL.

Williton,
September 12, 1795.

Mr. MORE.

SIR,

SIR,

I OUGHT indeed to apologize for my omiſſion reſpecting the Engliſh Opium: I need not obſerve that, in its ſenſible properties, it does not ſeem inferior to any, and that it poſſeſſes the advantage of being perfectly clean, which the foreign Opium never is; a circumſtance which muſt always affect it, when given in a crude ſtate; for I am not quite ſatisfied that the ordinary method of diſſolving in ſpirit, and evaporating the tincture, leaves the Opium in an improved ſtate as a medicine. I have not had ſufficient for the experiment; otherwiſe I would have diſſolved large quantities of Engliſh and of Foreign Opium in ſpirit, for the purpoſe of procuring all the medicinal matter from each; and, if I am not much deceived, I think I ſhould have found, that the purified extract of the foreign would not have been ſuperior in efficacy to the Engliſh; that is, that if a grain, for inſtance, of each be diſſolved and evaporated, the pure product of the grain of

the

the foreign will not be more efficacious than the pure product of the Engliſh grain.

I have made trial of one grain of it in a pill with ſoap upon myſelf, to allay a tickling cough which prevented ſleep, and it effectually relieved me; and this I repeated the next evening, with the like ſucceſs. I tried it alſo with a gentleman who had been in the regular habit of taking two grains of Opium every night, by ſecretly ſubſtituting an equal quantity of the Engliſh, and there was no obſervable difference in the effects; from which I concluded, that there is very little difference to be ſtated of their comparative efficacy, ſince, upon withdrawing only a quarter of a grain from the uſual doſe upon a former occaſion, the night ſeemed to be leſs comfortable; but this might perhaps have been merely accidental. However, if, upon future trial, it ſhould even be found inferior in efficacy in equal doſes, yet when the doſe becomes exactly aſcertained, I think its natural purity will give it a decided preference over that which muſt be purified by art; and, in its effects,

I expect

I expect we ſhall find it more conſtant and more equal. I have the honour to be,

SIR,

Your obedient ſervant,

J. LATHAM.

Bedford Row,
January 18, 1795.

Mr. MORE.

SIR,

IN conſequence of the requeſt from the Society for the Encouragement of Arts, Manufactures, and Commerce, I have adminiſtered the Engliſh Opium; and it affords me much ſatisfaction to be able to report, that I have found the Opium to be equally powerful, and to produce the ſame effects as the beſt foreign preparation of this drug. If it be required by the Society, I will with much pleaſure ſtate to them a deciſive caſe of the efficacy of the Engliſh Opium. I have the honour to be,

The Society's moſt obedient
and moſt humble ſervant,

GEORGE PEARSON.

Leiceſter-Square,
March 9, 1795.

SIR,

SIR,

I HAVE made trial of the Engliſh Opium, which you ſent to me from the Society, in a variety of caſes, and find it equal in point of ſtrength to the beſt extract from foreign Opium, and far ſuperior in flavour, which, in the extract, is much injured by the boiling: it is likewiſe free from thoſe impurities which are ſo abundant in the crude foreign Opium.

I am, SIR,

Yours moſt reſpectfully,

GEORGE WILSON.

Bedford-Street,
April 15, 1795.

Mr. MORE.

PAPER

PAPER
IN
MANUFACTURES.

MANUFACTURES.

The Society had long conſidered the WEAVING FISHING-NETS as an object of very conſiderable importance, and during many years offered Premiums for obtaining that end, but without ſucceſs, till this Seſſion; when a proper Specimen of the Netting having been produced, and found, on examination, to have every requiſite wiſhed for, the Premium of FIFTY GUINEAS was adjudged to Mr. J. W. BOSWELL, of Barnſtaple, the Inventor of a Machine of which a Plate is annexed, and a Sample of the Netting reſerved in the Society's Repoſitory for the inſpection of the Public.

SIR,

I BEG leave to preſent, for the inſpection of the Society, a ſample of Net, more than eight feet wide and thirty yards long, made on a machine of my own invention.

On this machine ſixty-eight meſhes are made at the ſame time, and by the ſame motion, with a perfect faſt knot, the ſame as uſed by fiſhermen, and the net made thereby has a perfect ſelvedge; circumſtances which, as they include whatever is regarded as neceſſary to perfection in Netting, will, I humbly hope, entitle me to the approbation of the Society for this invention, and procure me the diſtinguiſhed honour of their Premium offered for the beſt ſpecimen of Netting.

I ſend along with this a voucher, ſigned by the Mayor, ſome of the Corporation, and other moſt reſpectable inhabitants of this town, who ſaw me make Net on this machine: this, though not ordered, I ſend, that no proof of the truth and reality of the invention may be wanting to the Society.

I hope ſoon to preſent a ſample of exceeding fine Net, in imitation of lace, made on a finer machine, which I have now nearly ready for working. This invention, as a circumſtance equally curious and novel, may be of great utility to this country,

country, in diminiſhing the large ſums that annually leave it for the importation of lace.

I am, SIR,

Your very humble ſervant,

J. W. BOSWELL.

Barnſtaple, Devon,
Dec. 7, 1795.

Mr. MORE.

WE, whoſe names are hereunto ſubſcribed, do teſtify and declare, that we ſaw J. W. Boſwell, of the town of Barnſtaple, in the county of Devon, make Netting, ſuch as is uſed in the Herring Fiſhery, on a machine by which he made ſixty-eight meſhes at the ſame time, and by the ſame motion.

And we teſtify, that we examined the knot uſed in this Netting, and found it to be the ſame as that uſed by fiſhermen in their nets, and eſteemed by them the faſteſt and beſt knot; and we declare, that we ſaw the breadth of the ſaid Netting meaſured

ſured as it was taken from the machine on which it was made, and that it exceeded ſix feet by more than two feet.

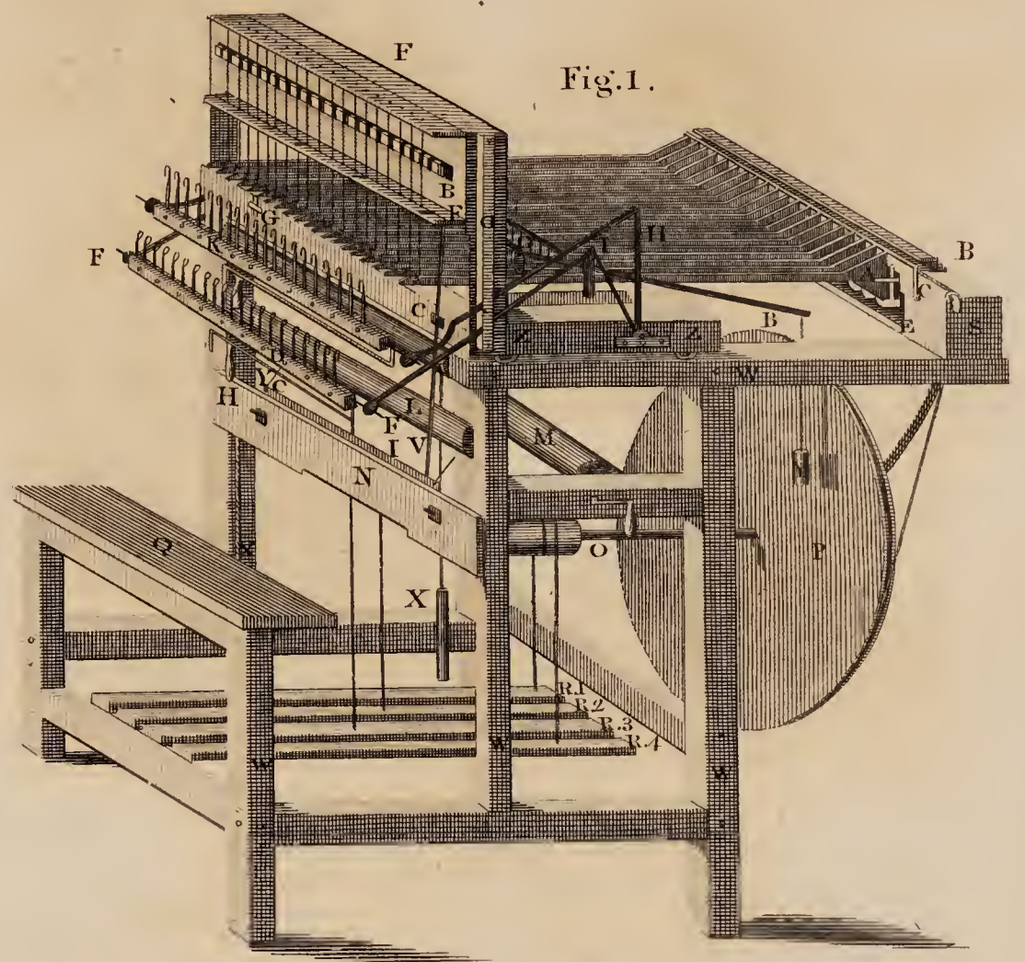
CHARLES MARSHALL, Mayor.
H. GARDINER TIPPETTS, Senior Alderman.
JOHN ROBERTS.
WILLIAM SPURWAY, Clerk.
JOHN CUTLIFFE.
JOHN HILL, Surgeon.
JOHN JENKINS.

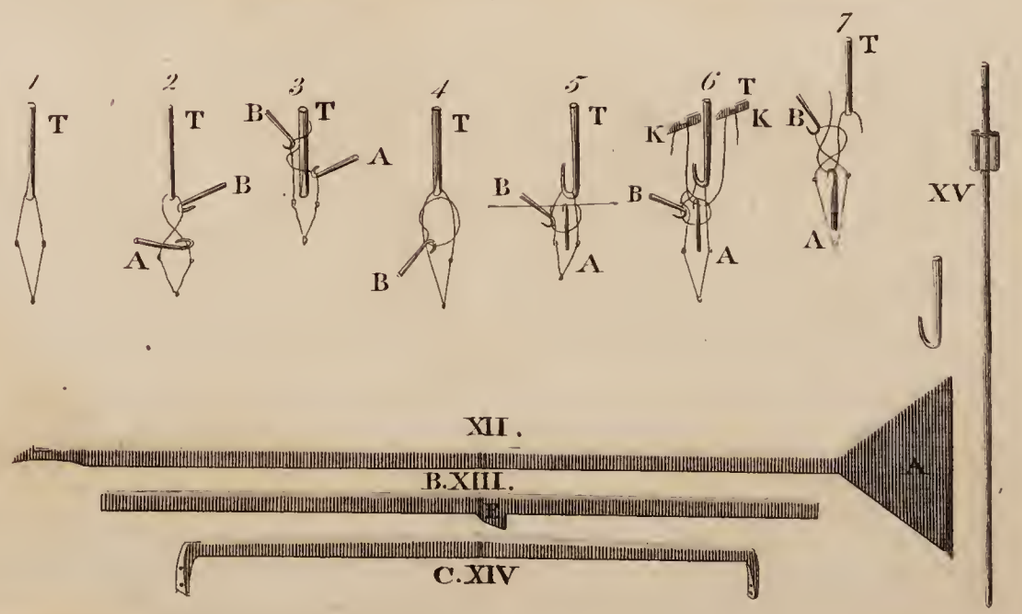
MR. BOSWELL had the above-mentioned machine made in my factory. I ſaw the various ſtages of its conſtruction, and, when complete, I ſaw him make Net upon it. The machine is very ſimple, and not in the leaſt complicated in any reſpect; and the above account is exact.

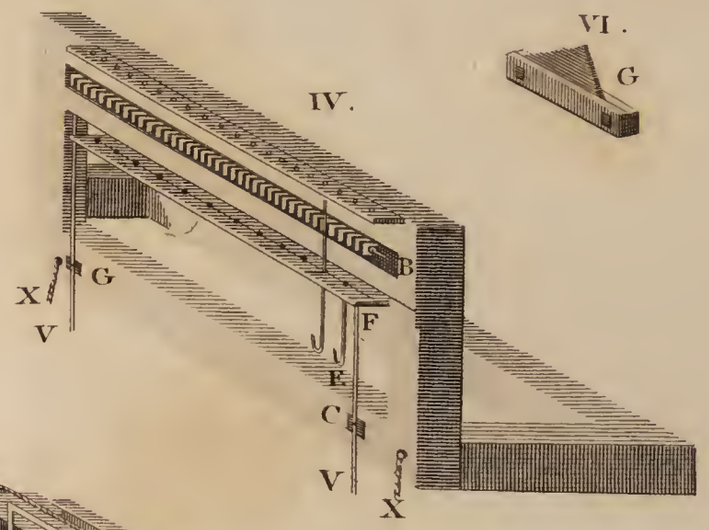
R. MARCH.

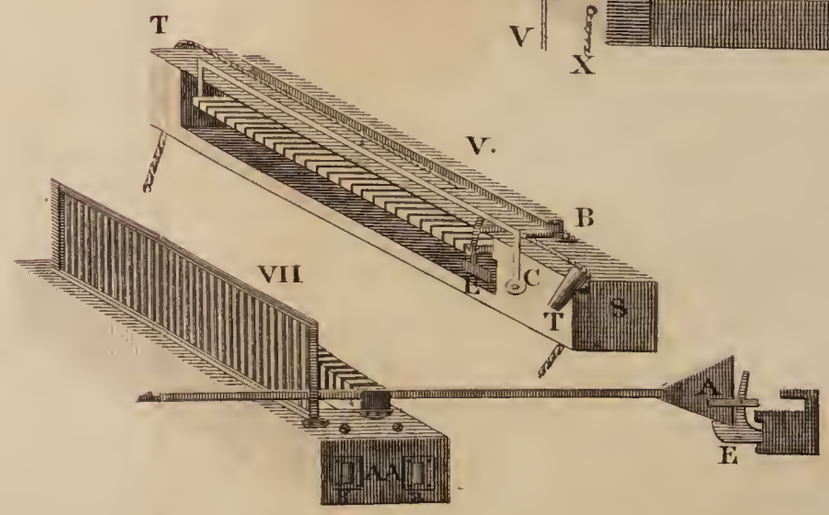
Deſcription

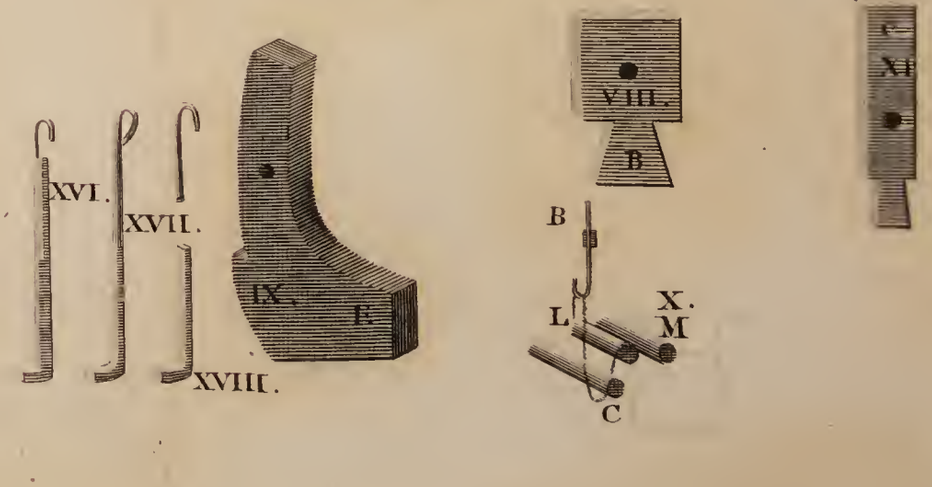
Fig. 1.











II.

Mr. Boswell's Machine for Weaving Fishing Nets.

Deſcription of the Plate of Mr. J. W. Boswell's *Netting Machine.*

Fig. i. An oblique view of the machine.

A (ſhewn more diſtinctly in *fig.* xii), is ſupported on its centre, and reſts on the catch, E, at its extremity: when the catch, E, is moved, the extremity of A falls on a bar of wood placed under it, whoſe diſtance from E regulates the length of the meſhes of the net (this bar could not be repreſented in this view). The extremity of A is made large, that it may act as a weight, and ſhould weigh near a pound weight; by its ſhape, it keeps A between the comb at the catch, E; ſo that, in riſing to the catch, it cannot eſcape it at either ſide: its head riſes between the turning hooks in the part F, and, as it riſes, draws up the twine paſſed through the formed meſhes (as will be deſcribed), to form a new row of meſhes. Its centre is ſupported on a thick wire in the comb (better ſeen in *fig.* vii); its front paſſes through a ſleigh, repreſented in *fig.* vii, to keep it from ſhifting to either

ſide: the comb is compoſed of pieces of braſs, of which *fig.* viii is the exact repreſentation in ſhape; the lower part, B, of thin pieces, ſecured between two flat bars of iron tranſverſely, and made faſt by pewter caſt between them: thoſe flat bars are rivetted together at each end to a piece of iron placed between them, of the thickneſs of the breadth of the lower part, B, of *fig.* viii, and have pieces projecting from them at right angles, by which they are firmly ſcrewed to the mahogany frame, A A, *fig.* vii. The ſleigh is ſcrewed to the top of the frame, A A, in the front; and the ſaid frame, A A, is ſcrewed down to the ſtand of the machine (the ſleigh is made in the ſame manner as ſtocking-frame ſleighs are made). The extremity of the part, A, *fig.* i, reſts on the catch, E, which is repreſented in *fig.* ix; this catch, E, is ſupported on a thick wire through its centre in the comb, as repreſented in *fig.* v: this comb is compoſed of pieces of braſs, of which *fig.* xi is the exact repreſentation, fixed in the ſame manner as the comb already

ready deſcribed; the front part, C, of this part, *fig.* xi, is thus elongated, that it may paſs between the extremities of the parts A, *fig.* i, and ſerve as a guide to prevent their miſſing the catches: the comb is ſcrewed to the piece of deal, S, and a deep groove cut under it for the extremities of the catches to play in. The piece S is ſcrewed to the ſtand of the machine, as ſeen in *fig.* i. There are ſixty-nine of the parts, A, *fig.* i, and ſixty-nine catches; ſeventy of the parts, *fig.* viii, and ſeventy of the parts, *fig.* xi. The parts A, *fig.* i, are called jacks: to move the catches from the end of the jacks, and let them fall, the ſlur, *fig.* vi, paſſes behind them; and, as it moves, its inclined plane, G, puſhes the top of the catches forward, and conſequently moves the bottom parts from the jacks: the inclined plane of the ſlur runs within the part C of *fig.* v, which keeps it from riſing up, and its back part or body runs in the part B, *fig.* v, made of ſheet-iron, which keeps it from ſtarting back. T T, *fig.* v, are boxes which hold pullies, over which the cord, which is

faſtened to, and moves the ſlur, paſſes, round the large wheel P, *fig.* i, which, as it moves half round and back again, moves the ſlur backward and forward: the ſlur is compoſed of two pieces ſcrewed together, that the inclined plane on the lower piece may be put forward to the proper point for throwing off the catches. The large wheel, P, is moved by the axle, O, on which is a roller, round which cords paſs to a treadle at each ſide, ſo that, by preſſing down the treadle, R, *fig.* i, the ſlur moves to the left, and, preſſing R, *fig.* iv, moves to the right: the axle, O, is ſupported in front by part of the ſtand, and at the back by two oblique pieces ſcrewed above to the piece S, which meet in a point to ſupport the axle behind: when the ſlur has moved off all the catches, and the jacks are all fallen, the jacks are brought into their firſt poſition into the catches, by the bar, *fig.* xiv, that paſſes above, acroſs them all, and is ſcrewed at each end to the parts B, one of which is repreſented more at large, *fig.* xiii, and is counterbalanced by the weight,

weight, Y, at the other extremities of the parts B. On the part B is a catch, F, which will be explained. Two ſtrong wires paſs from the ends of the bar, *fig.* xiv, downwards, to the end of a flat wooden piece that lies behind N, from the centre of which a cord paſſes to the treadle, R, *fig.* ii; on preſſing down which, all the joints are put into the catches, and another motion performed, which will be explained: as the weight is very great, the treadle, R, *fig.* ii, may be aſſiſted with a moveable pulley. F is a frame of mahogany, repreſented in full, *fig.* iv: this frame is moveable backwards and forwards, and is kept in its place by the fixed frame, *fig.* vii, which it encloſes; it is armed with flat pieces of iron ſcrewed on at the places of friction, and the friction is eaſed by braſs rollers, B B, fixed at the end of the frame, *fig.* vii, and the braſs rollers, Z Z, in the ſtand of the machine, on which rollers the frame, F, reſts: this frame ſupports ſixty-eight turning hooks, one of which is drawn of a larger ſize, *fig.* xv; theſe hooks turn in

the

the braſs pieces, C and F, *fig.* iv; the upper part in holes drilled to fit them, and the lower part in the collars which are formed in F, by the holes made between it and the ſmall pieces ſcrewed in its front, which are made ſo in preference to being in one piece, that, if any of the hooks ſhould be broken, it may be taken out without diſturbing many of the reſt: at each end of the ſixty-eight turning-hooks, there is a fixed hook, E, whoſe uſe is to guide the twine for forming the new meſhes: to this frame is alſo ſcrewed the ſupports of the jointed frames, H and I, which ſupport the pieces, D and K, at their extremities; the double joints of theſe frames allow D and K to be moved up and down and backwards and forwards; and at G are ſcrewed two pieces of flat iron at each ſide of the frame, with proper intervals between them, of the ſize of the ſides of the frame, H and I, between which thoſe ſides move freely up and down, backwards and forwards; but which prevents all lateral motion. The part D is repreſented more at large, *fig.* iii; the part

part K differs from it only in the ſhape of its hooks, and the poſition of its handle, which is in the middle of it: D is ſupported on the pieces F F, in the ends of the frame, I, *fig.* i; and, as D is not as long as the interval between the ends of I, it allows it a lateral as well as a circular motion. C is a ſmall bar bent at the end, and drilled at the bent part ſo as to ſlip forwards and backwards; on the axle F there is a ſlit in its head, through which the iron ſpindle of the handle, H, paſſes, and keeps it in its proper poſition; the ear bent down by the handle, H, when preſſed by the thumb towards H, moves C forward on F, and, in this poſition, the hooks of this frame meet the turning hooks, or paſs exactly under them; but when the thumb is removed, and the handle, H, preſſed to the left, the hooks of this frame then paſs between the intervals of the turning hooks: the hooks of this frame, D, are repreſented larger at *fig.* xvii; the hooked part is bent till it comes oppoſite the body, leaving an interval ſufficient for the twine to paſs be-

tween

tween its end and the body of the hook: theſe hooks are firmly fixed between D, which is an iron plate, and a piece of mahogany of the ſame ſize, by the ſcrews there repreſented; the bent part of the tail of the hook enters into the mahogany: the part, *fig.* xviii, is put between every two hooks, to preſerve the proper interval between them, and a ſlip of leather paſſes all along between them and the iron; and thus, when the ſcrews are turned tight, all the hooks are very firmly fixed (the mahogany of theſe pieces ſhould be very hard, to prevent the heads of the ſcrews from ſinking into it, which they are otherwiſe apt to do): the hooks of K are repreſented of a larger ſize, *fig.* xvi, and ſecured in the ſame manner as thoſe of D.

The turning-hooks are moved in manner following (ſee *fig.* iv):—behind the pinions of thoſe hooks there is placed the rack, B, which moves in a groove cut in the mahogany frame; in each end of this groove is a mortice, through which paſſes a piece of iron from the rack, at right angles

angles to it, to the back of the piece in which the groove is made: the iron bar (of which part is ſeen at V, *fig.* i) moves on a bolt paſſed through it, and through the holes C; and another ſimilar to it, is bolted on at the hole G: the heads of theſe bars have ſlits in them, through which ſcrews paſs to the pieces that project backwards from the rack, B; and their lower extremities are faſtened by ſcrew and nut to the deal piece, N, *fig.* i, which piece has a place cut in it, to admit the knees of the perſon who works on the machine; and thus, as he preſſes the piece N, with his knee to the right, the heads of the part V preſs the rack to the left, and thus turn all the hooks as far one way as is required; and when he preſſes N to the left, the hooks are turned the contrary way.

The netting hangs on the turning hooks, deſcends below the roller, L, *fig.* i, then paſſes under a weighted roller which hangs looſe in the netting, and afterwards aſcends and paſſes over the roller L to the roller M, on which it is rolled up as it is made; and

M is

M is ſecured from returning, by a catch and ratchet-wheel, in the common manner: a ſketch of this is given at *fig.* x, where L and M repreſent the heads of the fixed roller, L and M, *fig.* i; B the turning hook, and C the moveable weighted roller which hangs in the netting. The frame, *fig.* iv, as before ſaid, moves forwards and backwards: it is moved backwards by a cord that paſſes from it over a pulley in the top of the ſtand of the machine to the treadle, R, *fig.* iii, and is retained by the catch, E, of the part *fig.* xiii, in that poſition, which falls down between it and the firſt frame, *fig.* vii; two heavy weights draw it forwards by cords, which paſs from them over pulleys in the front of the ſtand to it, when the part C, *fig.* xiv (which goes acroſs all the jacks, and draws them up into the catches), is pulled down by the treadle, R, *fig.* ii: the part B, *fig.* xiii, is pulled down at its head; conſequently the catch E, on it, is drawn up from between the frames, and the weights, no longer reſtrained by the catches, draw the frame,

fig. iv, forwards. When the frame, *fig.* iv, is drawn forwards, the turning-hooks are then an inch before the heads of the jacks, ſo that the netting hangs quite clear of them: when it is drawn backwards, the heads of the jacks have their notches exactly under the turning-hooks' intervals; ſo that, when their catches are moved back by the ſlur, their heads riſe between the turning-hooks, and draw up a loop each, when the twine is paſſed through to form the new row of meſhes. Q, *fig.* i, is the ſeat on which the operator ſits, and W W W, the ſtand of the machine: *fig.* ii, is a ſteel wire five feet and a half long, with each end formed as the end of a common netting-needle is: the beſt method of putting the twine on this needle is, to make a loop at one end, then draw the twine to the other end, and make another loop there; then back to the firſt loop, and draw a loop of the twine through it, and another loop through this new loop; then draw it to the other end, and do the ſame there; and ſo on, till there is twine enough for the needle.

needle. The uſe of this method is, that it admits the twine to be drawn off the needle as it is wanted, without ſhifting the needle or putting the hand to it, which is a great ſaving of time; theſe loops may be drawn through with eaſe by ſmall hooks: the needle, when not in uſe, lies in a ſmall trough of its own length, one of which is placed at each ſide of the machine, of the height, and in the line of direction of the bottoms of the turning-hooks.

The figures below *fig.* 1. ſhew the method of forming the knot; and what is here repreſented of one hook of each ſort, is performed in the machine by ſixty-eight of each at one time.

1. Shews the meſh on the turning-hook, in its firſt poſition.
2. Here the hook, A, is puſhed into the meſh, and the turning-hook turned half round; and the hook, B, puſhed into the interval, between the croſſing of the ſides of the meſh and the bottom of the turning hook.

3. The

3. The meſh is drawn up the turning-hook, by the hook B; the turning-hook is turned back to its firſt poſition, and the lower part of the meſh is paſſed over the hook of the turning hook, by the the hook A.
4. The hook A is removed, and the upper part of the meſh drawn over the hook of the T hook, and the lower part of the meſh which it contains, by the hook B.
5. The hook A is puſhed into the new loop formed by the motion A; the new loop is preſſed down by the hook A, ſo as to leave the interval between it and the bottom of the T hook as large as poſſible; the T hook is turned one quarter round, that the ſaid interval may face the end of the needle; the needle is drawn through, and leaves the twine behind; the hook A is drawn back, and embraces the twine it leaves.
6. The hooks remain in the poſition of 5; the jacks (of which K and K repreſent the heads) are made to aſcend one after

another between the T hooks, previous to the jacks being made to aſcend the frame; *fig.* iv is drawn back.

7. The T hook is turned back to its firſt poſition; the hook B is drawn upwards, while the hook A is held down, by which the knot is drawn open in its proper ſituation; and, at the ſame time, by preſſing the hook B a little forward as it riſes, the knot is drawn off the turning-hook T: the hooks A and B are moved at one ſide, ſo as to be between the intervals of the T hooks; they are preſſed a little back, that the ſide of the new meſh may lie over the hook of the T hook: the part C, *fig.* xiv, is pulled down by the treadle R, *fig.* ii (by which all the jacks are drawn down, their ends placed in their catches, and the catches of the parts B, *fig.* xiii, drawn up from between the frames, *fig.* iv. and *fig.* vii, which permits the weights to draw the frame, *fig.* iv, forwards); and at the ſame time the hooks A and B are preſſed down, which places the new meſhes on the T hooks,

hooks, while at the ſame time it frees them from the jacks: the hook B is withdrawn, preſſing it at the ſame time a little upwards: the hook A is withdrawn, preſſing it a little downwards:—and thus the knot and the meſh are completed.

The jacks, turning-hooks, jointed frame, H and I, front part of K and D, the guides G, the hooks of K and D, the parts C and B, *fig.* iv, the ſleigh, *fig.* vii, the parts *fig.* xiii and xiv, the ſlur, *fig.* vi, the bars V, *fig.* i,—are all made of iron. The catches, *fig.* ix, the combs, *fig.* viii and *fig.* xi, the ſupports of the turning-hooks, C and F. *fig.* iv, and the rack B,—are all made of braſs. The frames, *fig.* iv and vii, and the backs of K and D, *fig.* i, are made of mahogany; and the ſtand of the machine, and the parts S and N, the wheel P, and the rollers,—are made of deal.

N.B. The Drawings ſent by Mr. Boſwell, ſhew the parts of the machine of the full dimenſions; but, as it was not poſſible

to make them of that ſize in the annexed Plate, the original Drawings are reſerved in the Society's Collection for the uſe of the Public.

PAPER

PAPERS IN MECHANICKS.

MECHANICKS.

The SILVER MEDAL was this Seſſion preſented to Mrs. WYNDHAM, for her ingenious contrivance of a method of uſing to the beſt advantage, the power applied to the CROSS-BAR LEVER, for raiſing large weights, as deſcribed in the following Letter, and ſhewn by the Cut annexed.

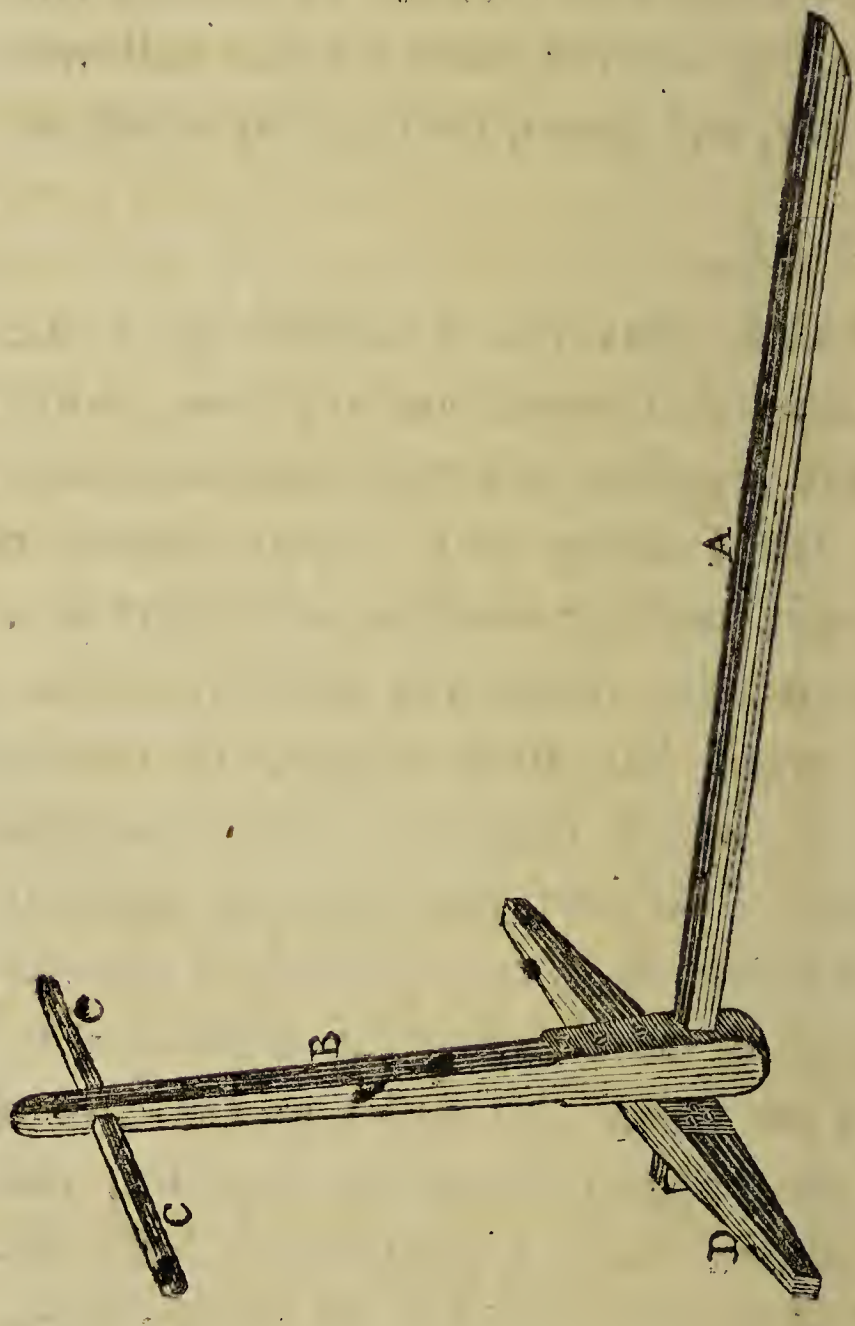
SIR,

I HAVE ſent you a Model of a mechanical invention of my own, which you will laugh at, as every body here did at firſt; but I aſſure you, it has proved of great uſe, and the workmen all approve of it very much. Since you left Petworth, a great work has been begun, of moving earth in which there are great quantities of ſtone; I obſerved that the men made uſe of the Lever in a very ineffectual manner, by ſtanding three or four at a time on the bar of the Lever; by which means ſome of them were placed ſo near the fulcrum, that their power was in a great degree loſt; beſides, they were obliged to ſteady them-

ſelves upon ſticks, for fear of falling, which took off from their weight upon the Lever.

My invention will be beſt explained by the Model.

Mrs. WYNDHAM's *improved Croſs-bar Lever.*



A, is

A is the Lever; B is an upright piece of wood to be fixed to the Lever, taking care that the ſide marked with the letter B be placed oppoſite the letter A, on the Lever; as by that means it inclines backwards, which increaſes the power: C is a croſs-bar for the workmen to hold by; D is a croſs-bar to be placed at bottom, behind the upright piece of wood for the men to ſtand upon, and the end of the Lever paſſes through it: theſe additions are made to take on and off, and are only to be uſed when the ſtrength of the rocks require an increaſe of power. The workmen all agree that it is of very great ſervice to them; and I wiſh I could prevail upon you to come here, and I dare ſay that your great knowledge would ſuggeſt ſome improvement.

I am, SIR,

Your obedient humble ſervant,

ELIZABETH WYNDHAM.

Petworth,
October 28, 1795.

In a ſubſequent letter, dated February 22, 1796, there is the following paſſage:

In

"In my explanation of the Lever, I forgot to mention, that if the rock to be moved ſhould be, as I have often ſeen it, placed ſo high above the ground as to put the men in danger of being hurt by falling, on the diſplacing of the rock, in ſuch caſe the Lever may be reverſed, ſo that the men will then ſtand upon the bar, where, in common caſes, their hands are placed; and thus they will not be in danger of falling."

The ſeveral parts of the Lever, as ſhewn in the Cut annexed, are marked as they were in the Model, which is reſerved in the Society's Repoſitory for the inſpection of the Public.

A Bounty

A Bounty of THIRTY GUINEAS was this Seſſion voted to Mr. JOHN UPTON, of Petworth, Suſſex, for his contrivance of a MOVABLE BARN-FLOOR, as deſcribed in the following Papers, and exemplified by the Plate annexed; and of which a complete Model, on a ſcale of one inch and a half to the foot, is reſerved in the Society's Repoſitory for the uſe of the Public.

THE heavy and continual expences attending Barn-Floors, and the great conſumption of valuable timber in the conſtruction of them, has always been very injurious to the landed intereſt of the kingdom; and the great waſte of Corn in threſhing upon them, as ſoon as they begin to decay, has ever been a heavy loſs to the tenants and to the public: it was therefore very deſirable that ſome new plan ſhould be diſcovered leſs waſteful and more durable.

John

John Upton, of Petworth, in Suſſex, has conſtructed a Barn-Floor in that neighbourhood, which he hopes will accompliſh both theſe objects. The Barn-Floors now in common uſe conſume the large and valuable oak-timber, often ſuch as might be converted into two-and-a-half inch ſhip-plank; and which is, at this time, very difficult to be procured at any price: they laſt only from fifteen to twenty years; and, as they are ſubject to frequent injuries from the exertions of the horſes in drawing loaded waggons into the barn, they require frequent repairs; and, if one plank fails, it cannot be effectually repaired without taking up all the planks from the door to the part that has given way.

Hollow beech-floors, which were introduced a few years ſince, on account of the very high price of oak-timber, are found not to wear more than ſeven or eight years, and conſequently do not anſwer. Hollow floors, whether of oak or beech, are much better to threſh on than thoſe laid on the ground; and, as the planks of the

propoſed Floors are much thinner than thoſe in preſent uſe, the vibration is ſtronger, and conſequently the corn more thoroughly threſhed out than on the common hollow floors.

The propoſed Barn-Floor effectually prevents a waſte of corn in threſhing; it gives an addition of at leaſt one foot in height at the doors, by which means a higher load of corn can be admitted; and alſo, as the horſes do not draw the waggon up an aſcent, and upon a ſlippery floor, but upon a hard bottom, and level with the farm-yard, two horſes can perform the work, where four are now generally uſed. It affords a warm and convenient ſhelter for hogs, when it is down; and, when it is turned up, it may be uſed as a ſtable, ox-ſtall, hovel, or cart-houſe; two men can place or diſplace it in five minutes: and, from its allowing at all times an eaſy acceſs to dogs and cats under it, it affords no harbour for vermin.

The following are Statements of the Materials uſed, and the Expence of the Barn-Floors, reſpectively.

BARN-FLOORS NOW IN COMMON USE.	£.	s.	JOHN UPTON'S BARN-FLOOR.	£.	s.
The original Floor laid on the ground, with three cills, and two-inch oak-plank, which in general laſts from fifteen to twenty years - - -	19	10	The new-conſtructed Hollow Floor is compoſed of oak-plank, five feet eight inches in length, and one inch and a half thick; whereas three-fourths of the plank uſed in the original Floors, are fourteen feet in length - -	23	10
The Hollow Floors on Brick Quoins, with two-and-a-half inch oak-plank - -	31	10			

The plank for the laſt-mentioned Floor may be compoſed of deal, beech, or elm, as they will be perfectly free from decay by damps, which will conſiderably leſſen the expence of the new-conſtructed Floor: the eſtimates are made when the materials are ſupplied by a carpenter. When they are furniſhed from the eſtate, a very conſiderable further advantage ariſes to the landlord, as the new-conſtructed floor is compoſed of ſmall ſcantlings, which may be had from ſhort timbers, much inferior in value to thoſe uſed for the other floors.

Where

Where there are more than one barn in a farm-yard, this Floor may be further uſeful, as it may be removed from one barn to another, and ſave the expence of at leaſt one out of three.

It is ſuppoſed that a Floor conſtructed in this manner will laſt for an hundred years, or indeed as long as the barn; becauſe it is perfectly free from damps, on account of the diſtance at which it lies above the ground, with a free current of air paſsing under it when down; and, when it is turned up (which it probably will be at leaſt half the year), it will be as free from decay as the poſts or beams of the barn.

WE, whoſe names are hereunto ſubſcribed, tenants on a farm whereon John Upton has laid his new-conſtructed Barn-Floor, do certify, that, in all reſpects, it exceeds every thing we have ſeen of its kind, particularly in threſhing, as its vibration aſſiſts the threſher beyond conception.

WILLIAM KNIGHT.
THOMAS HOLT.

SIR,

SIR,

I FIND they have threſhed ſome corn upon the new Barn-Floor, and the threſhers ſay it is the beſt floor they ever threſhed upon, on account of its ſuperior elaſticity, which I thought muſt be caſe; it has alſo another property, which I did not foreſee, and which is occaſioned by the great cavity under the floor, and which is alſo uſeful to farmers, that is, that every ſtroke of the flail reſounds ſo much, that it may be heard for a mile round; ſo that the farmer, when on any part of his grounds, can tell whether his men in the barn are working or idle.

I am, SIR,

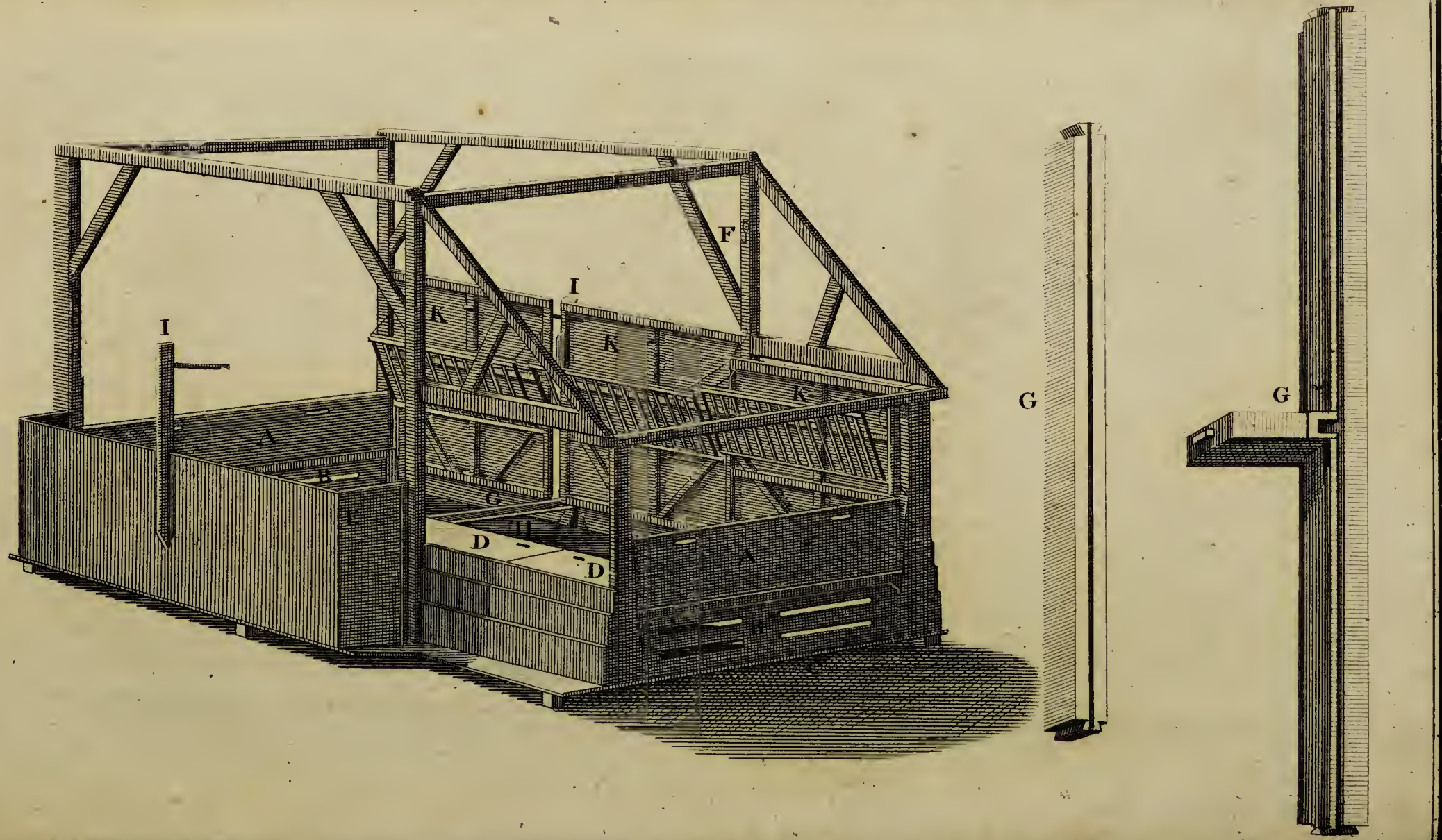
Your very humble ſervant,

EGREMONT.

Groſvenor-Place.

Mr. MORE.

Explanatoin


I
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Explanation of the Plate of Mr. UPTON's *new-conſtructed Barn-Floor, one part of which ſhews the Floor laid down for threſhing on; the other, the part raiſed up with racks for feeding Cattle, &c.*

A. Rack-boards.

B. Slip-boards, to admit air.

C. Wooden door-ſills for the ſlip-boards, B, to reſt on.

D. Moveable floors, to one part of which are wooden legs ſerving to ſupport it, when it is neceſſary to put the diſplaced timbers into the receſs E.

E. Receſs to receive the threſhed corn before it is winnowed, or to hold the moveable timbers.

F. An iron hook to lift up the floor, when not uſed for threſhing on: there are two of theſe hooks uſed in the barn at large.

G. Moveable timbers which ſupport the floor, having grooves along their ſurfaces, to prevent the loſs of corn: two

of theſe timbers are ſhewn larger at G G; one being the croſs-piece, with a leg and a tenon for fixing in the ſtone mortice; the other deſigned to lie lengthwiſe, and level with the floor of the barn: in the ground are fixed ſtones, with mortices in them, to receive the tenons of the above-mentioned timbers; but which, though ſhewn in the Model, could not be expreſſed in this ſmall Plate.

H. The ground, which ſhould be made of materials ſufficiently hard to prevent the horſes or waggon making impreſſion therein.

I. I. Poſts with iron haſps to ſupport the floors when out of uſe.

K. Racks to feed cattle, when the barn is applied to other purpoſes than threſhing on.

When the Floor is not wanted for threſhing on.

Firſt turn up the floors, and fix them faſt with the iron pins, bolts, and haſps; then take

take out the middle timbers ; next, the croſs timbers: place them on the ground, on that ſide which is oppoſite to the receſs, where the timbers are to be depoſited when out of uſe; then let down that part of the floor that has legs to ſupport it: put the timbers into the receſs, and turn the floor up again.

The Premium of FIFTY GUINEAS, that for ſeveral years paſt was offered by the Society for the forming a METAL ROPE or CHAIN, which ſhould anſwer the purpoſe of a Hempen Rope in large Manufactories, was this Seſſion adjudged to Mr. WILLIAM HANCOCK, of Birmingham, from whom a proper Sample of the Chain, and the annexed Certificates, were received; and of which a Wood Cut is annexed.

THIS is to certify, that I have ſeen a Chain or Iron Rope, invented by William Hancock, uſed by Mr. William Bingley, in his Plated-wire Manufactory, for the very powerful purpoſe of drawing large wire; and I obſerved, that it runs as flexible on the pulley as an hempen rope; and I believe it to be much ſtronger, and will wear much longer, than a rope of two inches diameter, made of the beſt hemp: and I do alſo believe, that its ſtrength may be more ſafely relied on, as the wire of which it is made, has, in every part of it, firſt

firſt borne an equal purchaſe, in being cold drawn, for the purpoſe of making the ſaid Chain or Iron Rope.

J. MILES.

Birmingham,
October 31, 1795.

THIS is to certify, that I have frequently ſeen and admired, an Iron Chain uſed in Mr. Bingley's Manufactory for Drawing Wire, made on Mr. Hancock's principle; and which I have no doubt will anſwer the purpoſe of drawing coals much better than a rope, it having an advantage of being as ſtrong where it coils round a ſmall barrel as where it is ſtrait. A rope is weakened in being bent, and takes more power to open and ſhut than the Chain. Bad iron cannot be uſed in it, nor can a faulty place eſcape being found, in the operation of cold-drawing.

WILLIAM WHITMORE.

Birmingham,
October 31, 1795.

SIR,

IN order to ſtrengthen the claim, the inventor of the Metallic Rope or Chain has to the bounty and encouragement of the Society, I take the liberty to acquaint you, that I have made uſe of ſuch Chain, made by William Hancock, for about four years: it works over a nine-inch pulley, and anſwers admirably well; and as, from Hancock's ſituation in life, he is not able to make them for ſale, I have executed many orders: and, if you have any opportunity to recommend a trial of them to any gentleman you may know in London, ſhall eſteem it a favour, as I am ſure they ſurpaſs any thing of the kind hitherto made.

I am, SIR,

Your obedient humble ſervant,

WILLIAM BINGLEY.

Birmingham,
November 19, 1795.

SIR,

SIR,

I AM favoured with yours of the 27th paſt, reſpecting Hancock's Iron Rope or Chain, and have, in reply, to inform you, that a Chain of his making is now in uſe at our foundery here; and has been, for five or ſix years paſt, uſed inſtead of a rope at the large triangles, for loading caſtings, breaking old guns, metal, &c. The iron or wire of which it is made, is about three-eighths of an inch diameter, and occaſionally lifts two or three tons.

We had ſome time ſince a chain of that kind worked in a pit about fifty yards deep, and a hempen rope to work againſt it; but the colliers taking a prejudice againſt it, we employed it otherways.

We have now, at moſt of our engines where ropes are required, adopted thoſe Chains for drawing up piſtons from the cylinders, &c. and, where ropes are ſubject to ſteam and wet ſituations, they are far preferable to ropes, as they work perfectly pliable and eaſy over either pulleys or rollers.

We have had ſome of thoſe Chains made from Engliſh and Foreign Iron, but they have ſometimes failed, through the iron being faulty.

The only iron to be depended upon, is thick wire, as the drawing of it detects any fault in the quality. Chains made from this wire would come into more general uſe inſtead of ropes, if it were not for the ſcarcity as well as high price of this kind of iron.

We have had a Chain from Hancock a few weeks ſince, ſeventy-one yards long, bare three-eighths wire, weight two hundred and ſixteen pounds, or about three pounds per yard; will work two tons. If the obſtacles before mentioned were not in the way, we ſhould have thoſe Chains in more general uſe than they are; but this objection ſhould not deprive the claimant of the merit due to his invention.

I am, SIR,

Your moſt obedient ſervant,

WILLIAM JOHNSON.

Bradley,
Dec. 2, 1795.

Mr. MORE.

Mr.

Mr. WILLIAM HANCOCK's *Metal Rope or Chain.*

Deſcription of the Cut of Mr. HANCOCK's *Iron Rope or Chain.*

Theſe Chains are deſigned as a ſubſtitute for ropes, and applicable to all the purpoſes to which they are adapted, particularly in the working of coal and other mines; alſo for cranes, wells, &c. From the mode of making the common Chains, they are very uncertain, and are known to break in the welded parts when over-ſtrained; which objection is, in theſe Chains, removed, by the manner in which they are made, being woven together (while cold) out of the ſtouteſt iron drawn into wire, and ſo managed, that it is next to impoſſible there ſhould be a bad link.

FORTY GUINEAS, being the Premium offered for a method of CLEARING NAVIGABLE RIVERS of WEEDS, was this Session adjudged to LE CHEVALIER DE BETANCOURT MOLINA, whose Paper and a Plate of his Contrivance are annexed.

SIR,

I HAVE the honour to transmit to you, to be laid before the Society for the Encouragement of Arts, Manufactures, and Commerce, a Model, with a Drawing and Explanation, of a Machine for clearing Navigable Rivers and Canals from Weeds.

Should my idea fortunately meet approbation, I shall deem myself amply recompensed in receiving the distinguished mark of honour proposed by the Society for the successful invention of the above object. I have the honour to be most respectfully,

SIR,

Your most obedient servant,

DE BETANCOURT MOLINA,

Director of the Royal Cabinet of Machines of his Catholic Majesty.

Hans Place, Sloane-Street, Chelsea,
January 31, 1796.

Mr. MORE. *De-*

Deſcription of the Plate of the Machine for Cutting Weeds in Navigable Canals and Rivers.

To clear Navigable Canals and Rivers from Weeds, which commonly grow in their bottoms and banks, two operations are requiſite; firſt, either to cut or pluck them up by their roots; and next, to take them out of the water, if the current be not ſtrong enough to carry them away.

The ſecond operation is evidently of ſmall importance: the firſt is the only one for which a machine ſeems neceſſary to be propoſed to the public, by the Society for the Encouragement of Arts, Manufactures, and Commerce.

A machine calculated for plucking up weeds by the roots would neceſſarily require a great variety of motions, and parts of different ſhapes, adapted to the different ſorts of plants, which would render the machine too complicated for the ſkill of that claſs of people for whoſe management it is intended; beſides, in ſtiff clays, in which

The Machine for clearing Navigable Rivers from Weeds invented by the Chevalier de Belancourt. Molina.

Fig. 1.

Fig. 2.

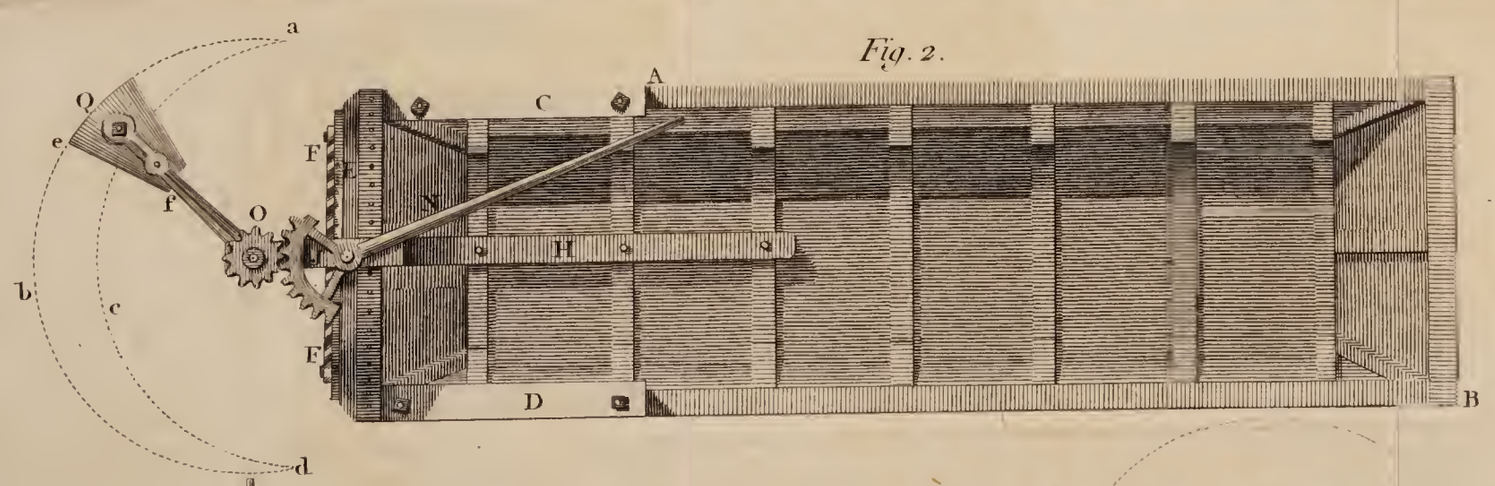


Fig. 5.

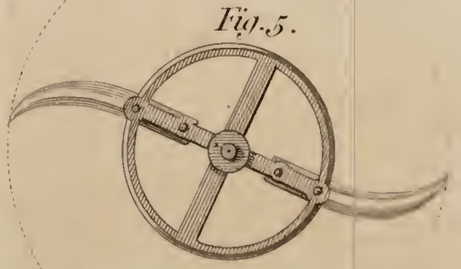


Fig. 4.

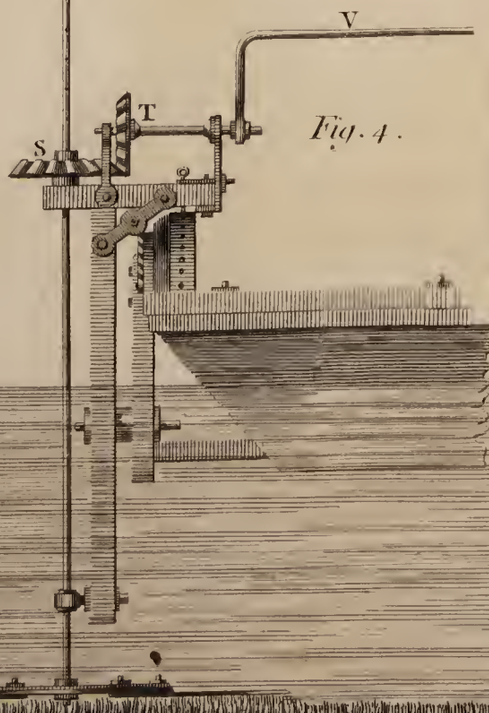
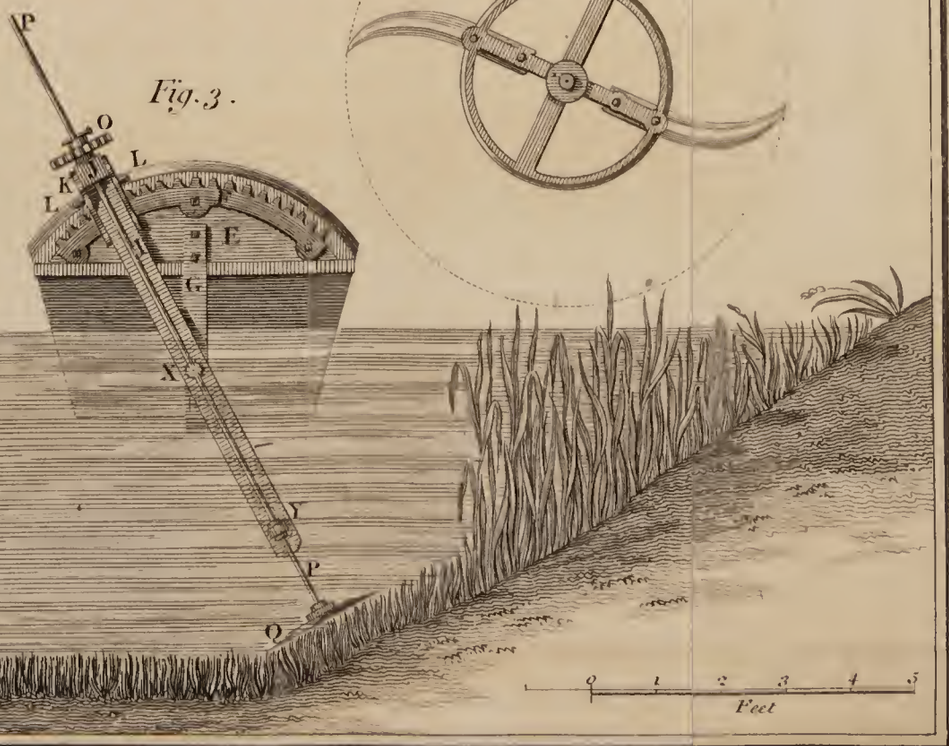


Fig. 3.



ABM

which the roots penetrate a conſiderable depth, it would require not only a very great power, but alſo ſuch a waſte of time as to render the operation too ſlow and expenſive; another inconvenience ſtill greater, attending ſuch an operation, would be, the deſtroying the texture which the fibres of the roots form with the earth, particularly in banks, thereby preſerving them from being deſtroyed by the current. The loſs of this protection would occaſion a gradual accumulation of earth in the bottom of the Rivers and Canals, and thereby render their navigation either difficult or impracticable. The Machine hereafter deſcribed, and ſhewn in the Plate, is therefore intended for cutting or mowing the weeds, and not for plucking them up by the roots, being perſuaded the former method is more conformable to the intention of the Society.

Fig. 1, 2. A, B. A barge or flat-bottomed boat, which ſupports the machine: its length, from eighteen to twenty feet; its breadth at the top, five

feet ſix inches; and its depth, two feet ſix inches: theſe dimenſions may vary according to the ſituations and uſes to which the machine is to be applied.

C, D. Two pieces of wood fixed in the ſegment E, *fig.* 3, and with which the machine is held faſt to the barge.

E. A wooden ſegment, whoſe arch is deſcribed from the centre X: this ſegment meaſures 90 degrees, and each 5th degree has a hole to receive an iron pin, with which the beam I J is fixed in a a direction perpendicular to the plane in which the weeds grow.

F. A quarter of a circle of caſt iron with teeth, fixed upon the ſegment E.

G. An upright poſt (fixed at one end upon the ſegment E, and upon a croſs poſt H), in which the axis X is faſtened.

H. A croſs poſt which pins through, and is fixed to the bottom of the barge, ſupporting the upright poſt G.

I J. A beam which moves upon the axis X: its length, from its axis X to its lower end,

end, ought to be in proportion to the depth in which the machine is to cut.

K. Two iron pieces faſtened to the beam I, and to the croſs-poſt J, and which are to receive between them a worm L, which is to take into the teeth of the quarter of a circle F.

L. An iron worm whoſe axis paſſes through the two iron pieces K, by which the beam I is to be brought to a direction perpendicular to the plane in which the weeds grow.

M. Axis fixed at the top of the beam I J, on which turns the lever N.

N. A lever which turns on the axis M, and whoſe ſhorter end terminates in a toothed ſegment, of about a third part of a circle.

O. A toothed wheel, whoſe diameter is one half the diameter of the one in which the ſhorter end of the lever terminates, and whoſe teeth take into them.

P. A rod of bolt iron, which paſſes through the centre of the wheel O, and through a ring Y, fixed near the bottom of

of the beam I J; on the lower end of which rod is fixed the handle of a cutter: this rod, at its upper part, has ſeveral holes, ſix inches diſtant from each other, and which are to receive an iron pin, which is to fix the wheel O, and to raiſe or lower the cutter according to the depth of water.

Q. The cutter with its handle, which is fixed on the iron rod P, which may be made of a variety of forms, to cut the weeds with a ſtroke neither too oblique nor too direct, which practice will beſt determine; but perhaps the ſimple form expreſſed in the figure would be as good as any. It is evident, that the lever N being moved by one or two men, the wheel O will turn, and with it, the rod P, together with the cutter. It is equally clear that, during the time in which the lever N deſcribes a quarter of a circle, the cutter will move a complete ſemicircle: the ſpace *a b d c a* will be cut at each ſtroke, the diſtance from *b* to *c* being the ſpace paſſed by the boat between

tween the ſtrokes, which muſt be leſs than the length *e f* of the cutter.

Having thus deſcribed the conſtruction of this Machine, and the manner in which it acts, let us conſider how it is to be uſed.

In every River or Canal intended to be cleared from its weeds, the firſt thing is to meaſure the depth of the water, and arrange the machine in ſuch a manner, that the end of the beam I. be at leaſt one foot, and the cutter about ſix inches, higher than the bottom. This being done, the barge may be drawn by a rope againſt the current, in order that the weeds may be carried away as they are cut: if the ſtream be not ſufficient for that purpoſe, a man or two at the lower end of the barge will eaſily draw them up into it by hooks, nets, or otherwiſe.

As weeds often grow on banks that have more or leſs obliquity, the beam may be placed in a direction perpendicular to the bank, by firſt taking out the iron pin which faſtens the croſs-poſt J and beam I, upon the ſegment E; then turn the worm L till the beam comes into the required poſition,

and fix it by the iron pin into the ſegment, as before. As the inclination of the ſides of Navigable Canals is never ſo great as an angle of 45 degrees, neither the arch of the ſegment E, nor that of the toothed piece F, need be greater than the quarter of a circle.

To ſharpen the cutter when neceſſary, the beam, by turning the worm all over the quarter circle F, is to be completely turned, ſo as to preſent its lower end, and the cutter upwards, which will be very eaſily done with the hand.

The repeated ſtrokes of the cutter may be preferable, when either the plants are ſo hard, or ſo thick, as to require a great force to cut them; but otherwiſe, the rotatory motion will be far more expeditious: in which caſe, there may be two oppoſite cutters (*fig.* 5); and the lever N, together with the wheel O, being taken off (*fig.* 1 and 2), two bevel-toothed wheels S T (*fig.* 4) will be placed, to be turned by the winch V: theſe cutters may be ſharp on both ſides, and, by changing the motion of either

either edge, may be uſed according to the nature of the weeds; and here it may be remarked, that the quicker the motion of the cutter, the eaſier will the weeds be cut, and leſs power loſt by their reſiſtance.

The diameter of the bevel-wheels in the figure is as two to three; but practice and judgment may ſuggeſt ſome alteration in the proportion of theſe as well as other parts of the machine, from the different reſiſtance required to be overcome.

PAPER

IN

COLONIES AND TRADE.

COLONIES AND TRADE.

In conſequence of the following Letter and Certificate, the GOLD MEDAL was this Seſſion voted to ROBERT WISSETT, Eſq. for having been inſtrumental in promoting the organzining Bengal Silk in England.

SIR,

AS the article of Raw Silk has occaſionally engaged the Society's attention, I take the liberty of ſubmitting to them the following facts, which, I flatter myſelf, will be found not altogether inconſiſtent with their views.

The magnitude and importance of our Silk Manufactures are too well known to need pointing out; yet, although they have been eſtabliſhed in full vigour for upwards of a century, our ſole dependance for the raw material has, till within theſe laſt twenty years, been entirely placed upon foreign powers: and indeed, notwithſtanding the great exertions that have been recently

made by the Eaſt-India Company, it will be ſeen that, even at the preſent period, we are obliged to have recourſe to Italy and other parts of the Continent for not leſs than eight hundred thouſand pounds weight of this commodity, at an expence of upwards a million ſterling per annum, one half of which is imported in a thrown ſtate; that is, having undergone the preparatory operation of twiſting, to render it more fit for the uſe of the weaver in the article of warp.

In my official capacity, as Secretary to the Committee appointed under the Court of Directors, to ſuperintend the Eaſt-India Company's commercial concerns, it came within my knowledge, that, in the Bengal Provinces (now forming a part of the Britiſh Empire), the culture of this article was capable of being very conſiderably extended: and, in converſation with various perſons, whoſe knowledge was competent to the ſubject, I became convinced, that Bengal Raw Silk could be thrown in this country, ſo as to ſerve as a ſubſtitute for a

very conſiderable portion of what is now ſupplied from Italy.

I thereupon ſubmitted my ideas to my Honourable Employers, who were pleaſed to reſolve upon a trial of the meaſure; and I have the pleaſure to obſerve, that, ſo far as the experiment has hitherto proceeded, it has anſwered every expectation that could be wiſhed.

At the ſale laſt week, twenty-nine bales, weighing four thouſand pounds, thrown principally at Macclesfield, ſold at very encouraging prices, which has fully eſtabliſhed the practicability of the meaſure; and when I inform the Society, that even this ſmall eſſay has given employment to upwards of five hundred perſons, that would otherwiſe have been deſtitute of means of ſubſiſtence, they will, I flatter myſelf, view it as a national object not unworthy of their favourable notice. I have the honour to be,

SIR,

Your moſt obedient humble ſervant,

ROBERT WISSETT.

Eaſt-India Houſe,
March 12, 1795.

Mr. MORE. SIR,

SIR,

IN reply to your letter of the 10th ult. you will be pleaſed to inform the Committee of Colonies and Trade, that the plan for organzining Bengal Raw Silk, was firſt ſuggeſted to the Committee of Warehouſes, who have the management of the Company's commercial concerns, by Mr. Wiſſet, their Clerk, whoſe merit on this and on other occaſions the Committee think highly of; and, in his official capacity, he has been very inſtrumental in forwarding its execution. Sir Stephen Luſhington being confined with the gout at the time of the receipt of your letter, is the reaſon why it has not been ſooner replied to.

I am, SIR,

Your moſt obedient ſervant,

D. SCOTT.

Eaſt-India Houſe,
April 9, 1796.

Mr. MORE.

REWARDS

REWARDS

BESTOWED BY THE

SOCIETY,

FROM OCTOBER, 1795,

TO JUNE, 1796.

REWARDS

BESTOWED IN

AGRICULTURE.

Claſs 1. TO JAMES DENTON, Eſq. for having planted thirty-eight acres with Acorns, the GOLD MEDAL. See page 117.

Claſs 9. To the Rev. JOHN ROBERT LLOYD, for having planted ſixty thouſand and twenty Oaks, the GOLD MEDAL. See page 120.

To THOMAS RICHARDSON, Eſq. for having planted one hundred and twenty-one thouſand four hundred and thirteen Mixed Timber Trees, the SILVER MEDAL. See page 124.

To

To THOMAS SKIP DYOT BUCKNALL, Esq. for his extension of Observations on Orcharding, the GOLD MEDAL. See page 207.

Class 85. To LEWIS MAJENDIE, Esq. for having dibbled fifteen acres with Beans, and sown the land the same year with Wheat, TWENTY GUINEAS. See page 131.

Class 97. To JOHN KINGSTON, Esq. for having planted twenty-four acres with Potatoes on land that had not borne Potatoes during the last ten years, FIFTY GUINEAS. See page 141.

Class 107. To Mr. ROBERT DAVIS, for having raised nine hundred and thirteen plants of the Rheum Palmatum, the GOLD MEDAL. See page 145.

To NICHOLAS ASHTON, Esq. for Curing Rhubarb, the

SILVER

SILVER MEDAL. See page 149.

Claſs 119. To Mr. JOHN CROCKITT, for having made two thouſand one hundred and fifteen yards of Hollow Drains, THIRTY GUINEAS. See page 183.

To Mr. EDWARD KNIGHT, for his Set of Harrows, FIFTEEN GUINEAS. See page 198.

To Mr. RICHARD EAGER, for his method of curing Hoven Cattle, FIFTY GUINEAS. See page 242.

Claſs 133. To Mr. RICHARD MOYLE, for having gained and ſecured from the inundation of the Sea, thirty-ſix acres of Land, the GOLD MEDAL. See page 152.

IN CHEMISTRY.

To Mr. JOHN BALL, for his method of preparing Opium from

from Poppies grown in England, FIFTY GUINEAS. See page 253.

IN POLITE AND LIBERAL ARTS.

Claſs 182. To Miſs ELIZA BARRETT, for a Drawing of a View at Carſhalton, after Nature, the GOLD MEDAL.

Claſs 183. To Miſs MARY ANN MASTERS, for a Drawing after Rembrant, of Abraham ſacrificing Iſaac, the SILVER MEDAL.

To Miſs HARRIET LETITIA WATTS, for a Drawing of Children, after Bartolozzi, the SILVER MEDAL.

Claſs 188. To Mr. JOHN JAMES MASQUERIER, for a Perſpective Drawing of Mr. Fulton's Mill for ſawing Marble, the GREATER SILVER PALLET.

To Mr. WILLIAM FADEN, for his Map of Suſſex, the GOLD MEDAL.

IN

IN MANUFACTURES.

Claſs 202. To Mr. J. W. BOSWELL, for his invention of Weaving Fiſhing-Nets, FIFTY GUINEAS. See page 273.

IN MECHANICKS.

To Mrs. WYNDHAM, for Croſs-bar Lever improved, the SILVER MEDAL. See page 295.

Claſs 214. To Mr. WILLIAM HANCOCK, for his invention of a Metal Rope or Chain, FIFTY GUINEAS. See page 308.

To Mr. JOHN UPTON, for his invention of a Hollow Moveable Barn-Floor, THIRTY GUINEAS, See page 299.

Claſs 218. To the Chevalier DE BETANCOURT MOLINA, for a Machine for Clearing Navi-

gable Rivers and Canals of Weeds, FORTY GUINEAS. See page 315.

IN COLONIES AND TRADE.

To ROBERT WISSETT, Esq. for introducing the organzining Bengal Silk in England, the GOLD MEDAL. See page 327.

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